SOUTHERN UTAH UNIVERSITY
HEAT PLANT FUEL TANK &
GENERATOR REPLACEMENT
DFCM# 06127730

DFCM DESIGN AND CODE CRITERIA

(Fee A.E: Attach and fill in applicable data for each drawing submittal)

Applicable Codes:	Year		Year
International Building Code	2003	International Mechanical Code	2003
Planning & Design Criteria to Prevent Architectural Barriers for the Aged and the Physically Handicapped.		International Plumbing Code	2003
		Ashrae/IES Energy Code	90.1-1999-2003
		National Electrical Code	2002

THIS PROJECT IS FOR EXTERIOR, UNDERGROUND FUEL OIL STORAGE TANKS.

A. Occupancy and Group : B / S-1 — EXISTING

Change in Use : Yes ____ No X — Mixed Occupancy : Yes ____ No ____

B. Type of Construction (Circle) — EXISTING

I	II	II	II	III	III	IV	V	V
F.R.	F.R.	1 HR.	B	1 HR.	N	H.T.	1 HR.	N

C. Location on Property : F.R. Ext. Walls (Hrs.): N.R. — Ext. Wall Opening(s) Protection (Hrs.) N.R. — Each Occupancy

D. Occupancy separation required (Hrs.): — EXISTING

Sprinklered: Indicate Yes or No

Stories : 1 or multiple

	EXISTING					
a. Actual Area²(ft)						
b. Basic allowable area :	EXISTING N.A.					
c. Allowable Area Increase due to side yards: N.A.	%	Area (ft)	%	Area (ft)	%	Area (ft)
		N.A.				
		N.A.				
d. Side yard area increase (ft):		N.A.				
Accumulative sub-total (b=d):		N.A.				
Sprinkler: area increase (x3 single)		N.A.				
(x 2 multi)		N.A.				
e. Total Allowable Area for a single story:		N.A.				
x 2 for multi-story building:		N.A.				
f. Ratio = a/e (Actual divided by allowable)		N.A.				

E. Fire-Resistive Requirements (Hrs.): (1 Hr., 2Hr., 3Hr., 4Hr., N. H.T.)

Exterior Bearing Walls:	N	Floors - Ceiling Floors	N/A
Interior Bearing Walls:	N	Roofs - Ceiling Roofs	N
Exterior Non-bearing Walls:	N	Exterior Doors and Windows	NR
Structural Frame:	N	Shaft Enclosures	NR
Partitions - Permanent:	N		

(OCCUPANCY SEPARATION - N.A.)

THE GREAT SEAL OF THE STATE OF UTAH — INDUSTRY — 1847 — 1896

State of Utah—Department of Administrative Services

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

4110 State Office Building / Salt Lake City, Utah 84114 / 538-3018

MECHANICAL ENGINEERS

WHW ENGINEERING, INC.
1354 EAST 3300 SOUTH
SUITE 200
SALT LAKE CITY, UTAH 84106
PHONE: (801) 466-4021 FAX: (801) 466-8536

ELECTRICAL ENGINEERS

BNA CONSULTING ENGINEERS
635 S. STATE
SALT LAKE CITY, UTAH 84111
PHONE: (801) 532-2196 FAX: (801) 532-2305

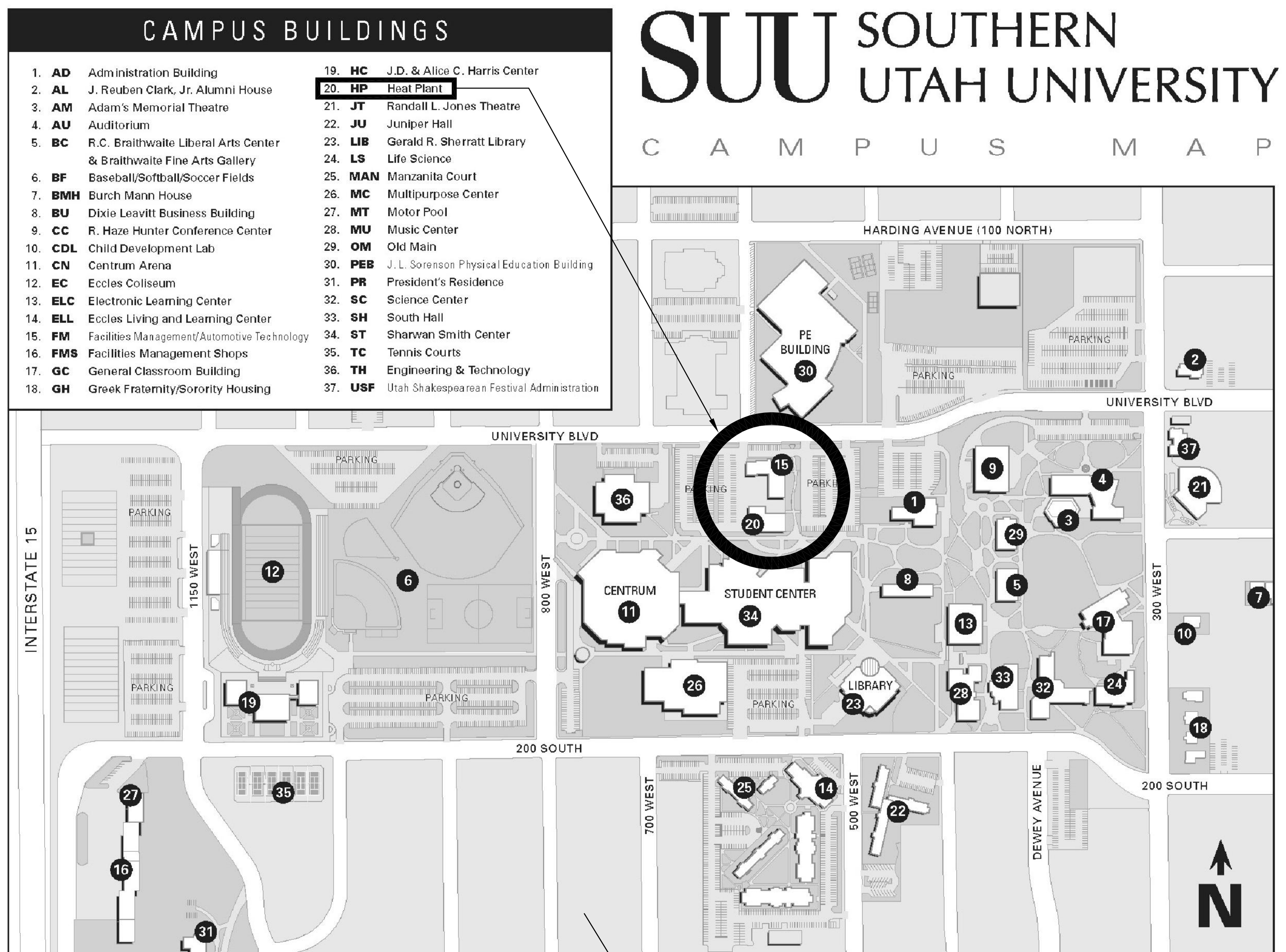
1070 W. 1600 S.
#A-104
ST. GEORGE, UTAH 84770
PHONE: (435) 628-3670 FAX: (435) 628-3680

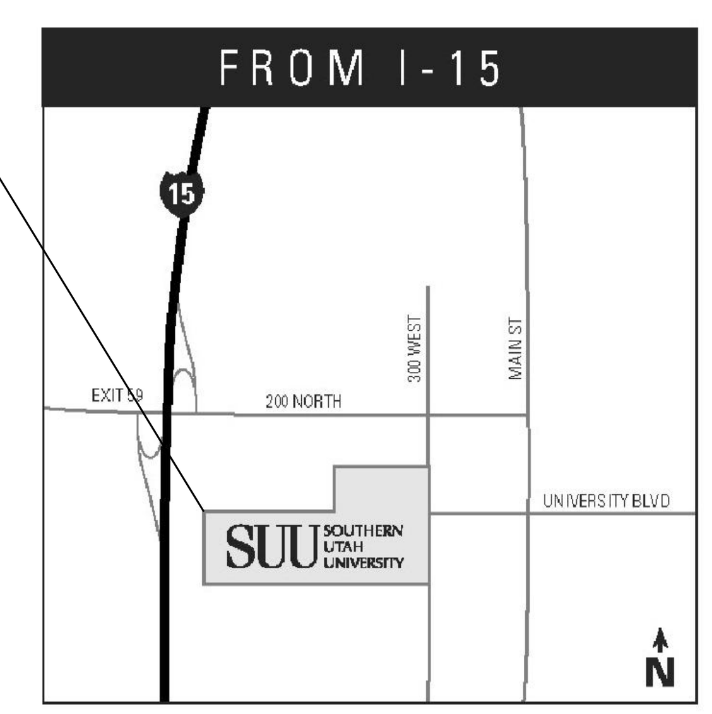
DRAWING INDEX:

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

MECHANICAL LEGEND

SYMBOL	ABR.	DESCRIPTION
FOS		FUEL OIL SUPPLY
FOR		FUEL OIL RETURN
V		VENT
F		FILL LINE
LD		LEAK DETECTION
M		MONITORING
MH		MAN HOLE
(ball valve symbol)		BALL VALVE
(check valve symbol)		CHECK VALVE
(flow arrow symbol)		DIRECTION OF FLOW
(strainer symbol)		DUAL BASKET STRAINER
UST		UNDERGROUND STORAGE TANK
(half-filled circle symbol)	POR	POINT OF REMOVAL
(quartered circle symbol)	POC	POINT OF CONNECTION
— —S— —		EXISTING SEWER LINE
E.O.T		EDGE OF TANK





DRIVING DIRECTIONS:

From Salt Lake City (Southbound I-15): Take exit 59. Turn right onto 200 North and travel east until you reach 300 West. Turn right and travel south until you reach Southern Utah University.

From Las Vegas (Northbound I-15): Take exit 59. Turn left onto 200 North and travel east until you reach 300 West. Turn right and travel south until you reach Southern Utah University.

GENERAL NOTES:

G-1 MECHANICAL INFORMATION IS NOT LIMITED TO THE MECHANICAL DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR INFORMATION ON ALL OTHER CONSTRUCTION DOCUMENTS INCLUDING DRAWINGS BY OTHER DISCIPLINES AND SPECIFICATIONS.

A - EACH DRAWING SHEET AND THE SPECIFICATIONS HAVE BEEN PREPARED TO SUPPLEMENT EACH OTHER AND THEY SHALL BE INTERPRETED AS AN INTEGRAL UNIT WITH ITEMS SHOWN AND NOTED ON ONE AND NOT THE OTHER BEING FURNISHED AND INSTALLED AS THOUGH SHOWN AND CALLED OUT IN ALL PLACES. ITEMS IN SPECIFICATIONS OR DRAWINGS LISTED WHICH ARE DIFFERING IN EFFICIENCY OR QUALITY SHALL BE HELD TO THE GREATEST OF: EFFICIENCY, QUALITY OR GOVERNING CODE.

B - THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE INSTALLATION OF THE SYSTEMS ACCORDING TO THE TRUE INTENT AND MEANING OF THE CONTRACT DOCUMENTS.

C - THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT WITH PROPER SERVICE ACCESS AND CLEARANCES ACCORDING TO MANUFACTURERS RECOMMENDATIONS. THE CONTRACTOR SHALL REVIEW SUPPLIERS BID PACKAGES FOR COMPLETENESS AND COMPLIANCE TO THE SPECIFICATIONS, SCHEDULES, AND DESIGN INTENT (ALL EQUIPMENT AND METHODS). THE CONTRACTOR SHALL REMOVE AND REINSTALL CORRECTLY AT HIS OWN EXPENSE ANY EQUIPMENT NOT IN COMPLIANCE.

D - THE CONTRACTOR SHALL CONSULT MANUFACTURERS INSTALLATION INSTRUCTIONS FOR SIZES, METHODS, ACCESSORIES, AND CLEARANCES IN SPACE AVAILABLE PRIOR TO BIDDING PROJECT.

E - ANYTHING NOT CLEAR OR IN CONFLICT WILL BE EXPLAINED BY MAKING APPLICATION TO THE ENGINEER IN WRITING.

G-2 ANY AND ALL ALTERATIONS TO THE SYSTEM SHOWN SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR. ENGINEER SHALL BE NOTIFIED IN WRITING PRIOR TO CHANGES.

G-3 CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATIONS.

G-4 THE WORKING DRAWINGS ARE DIAGRAMMATIC. THEY DO NOT SHOW EVERY OFFSET, BEND, OR ELBOW NECESSARY FOR THE COMPLETE INSTALLATION IN THE SPACE PROVIDED. ALL LOCATIONS FOR MECHANICAL EQUIPMENT AND TANKS SHALL BE FIELD VERIFIED AND COORDINATED WITH ALL DRAWINGS. THE CONTRACTOR SHALL PROVIDE PROVISIONS FOR CORE DRILLS THROUGH EXISTING FOUNDATION WALL.

G-5 THE INSTRUCTION TO "PROVIDE" ALSO INCLUDES INSTALLATION.

G-6 THE CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY IN HANDLING AND DISPOSING OF FUEL OILS, ETC. ALL SUCH MATERIALS SHALL BE HANDLED, DISPOSED, AND USED IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL LAWS.

G-7 THE MECHANICAL CONTRACTOR SHALL VERIFY MOTOR VOLTAGES WITH THE ELECTRICAL DRAWING BEFORE ORDERING MOTORIZED EQUIPMENT AND CONTROLS.

G-8 SUPPLIERS SHALL REVIEW ALL DRAWINGS AND THE SPECIFICATIONS PRIOR TO SUBMITTING PRICES TO THE CONTRACTOR. ALL QUESTIONS AND DISCREPANCIES SHALL BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO BIDDING.

G-9 CONTRACTOR SHALL THOROUGHLY REVIEW AND SIGN SUBMITTALS FOR COMPLETENESS AND COMPLIANCE TO THE SPECIFICATIONS PRIOR TO ENGINEERS REVIEW. SUPPLIERS SHALL HIGHLIGHT OR MARK ALL INFORMATION REQUIRED TO SHOW COMPLIANCE TO THE SPECIFICATIONS. ALL REQUESTED EXCEPTIONS TO THE SPECIFICATIONS, OR SCHEDULES SHALL BE CLEARLY NOTED AND EXPLAINED. SUBMITTAL REVIEW AND ACCEPTANCE IS FOR DESIGN CONCEPT ONLY, AND DOES NOT AT ANY TIME RELIEVE THE CONTRACTOR OF RESPONSIBILITY TO MEET SPECIFICATIONS, CAPACITIES, OR DESIGN INTENT.

G-10 ALL MECHANICAL AND PLUMBING SHALL BE INSTALLED AND CONFORM TO THE 2003 EDITION OF THE IMC AND IPC WITH UTAH ANNOTATIONS AND LOCAL AUTHORITY REQUIREMENTS.

G-11 ALL MATERIALS SHALL BE NEW AND SHALL BE DOMESTIC MADE UNLESS SPECIFICALLY APPROVED OTHERWISE IN WRITING BY ENGINEER OR OWNER.

State of Utah
Department of Administrative Services

Division of Facilities
Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267

Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW
ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

PROJECT NAME & ADDRESS

SOUTHERN UTAH UNIVERSITY HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

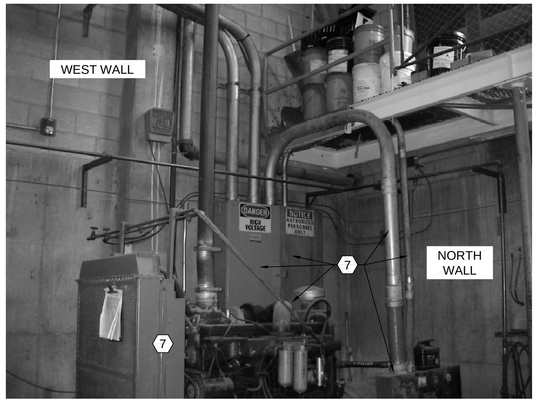
Cedar City, Utah 84720

MARK	DATE	REVISION

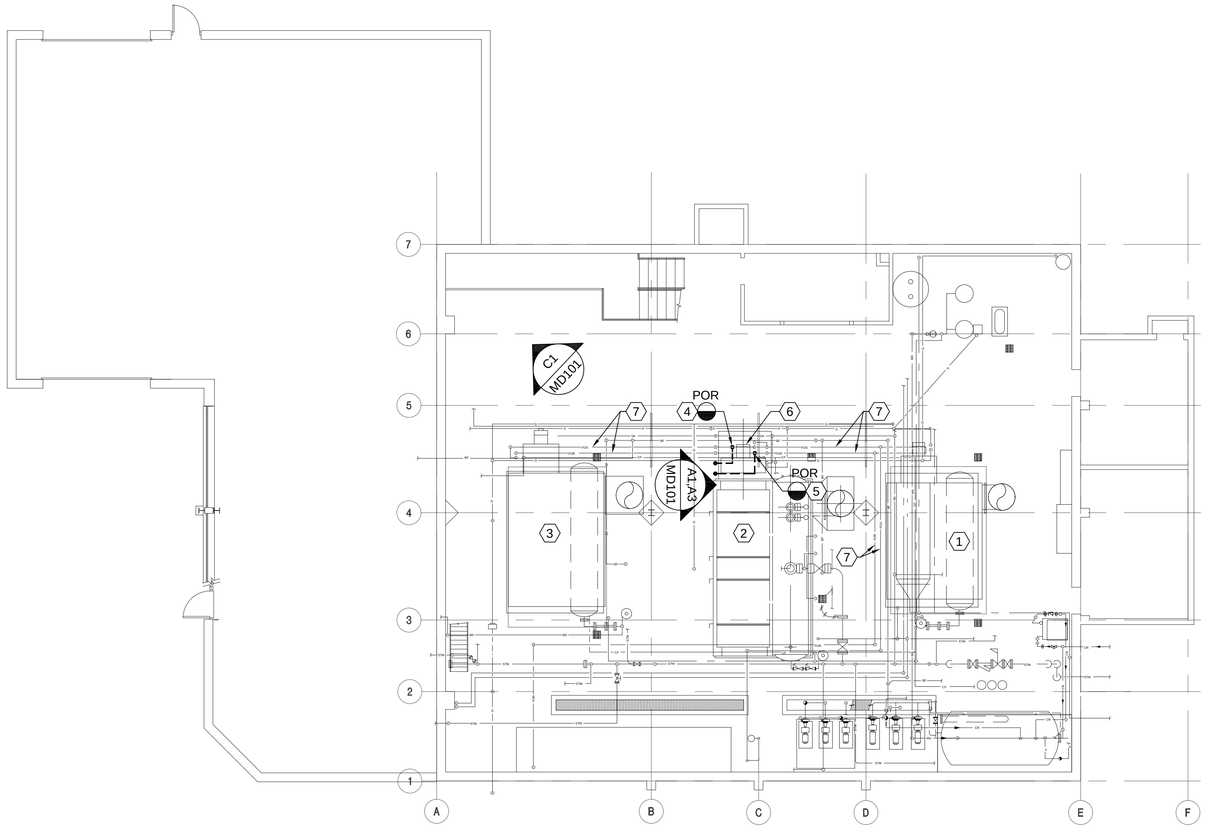
PROJECT MANAGER: WP
DRAWN BY: STAFF
CHECKED BY: SLW
DATE: 12/22/06
WHW JOB NO.: 06024

SHEET TITLE: **MAP, LEGEND AND GENERAL NOTES**

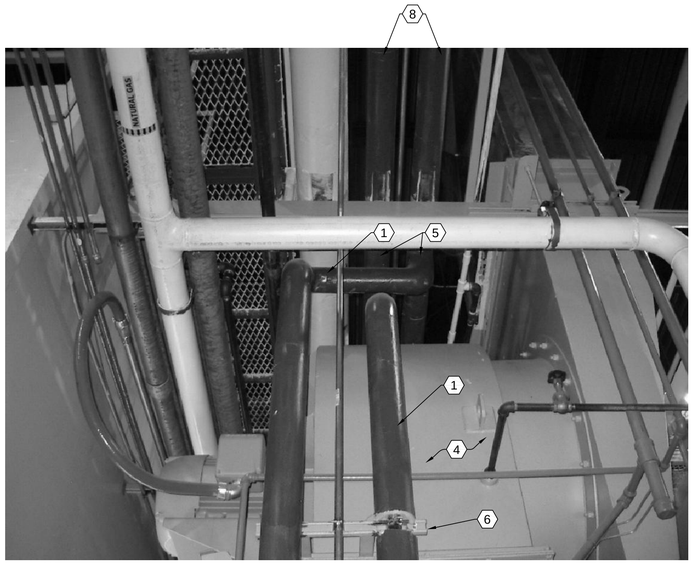
SHEET NO. **M001**



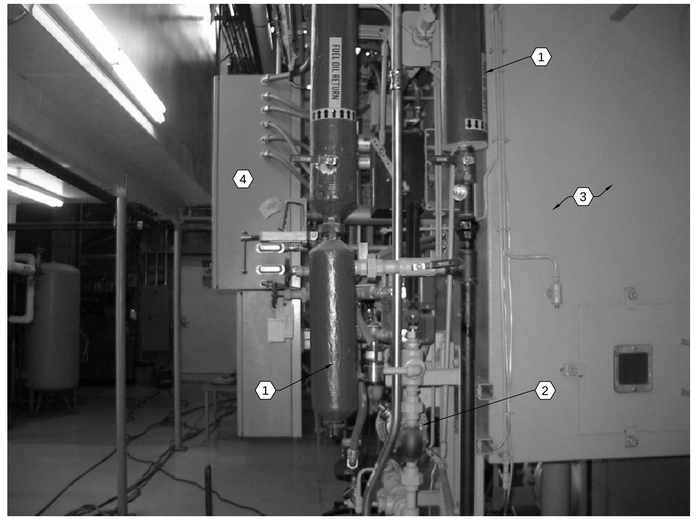
C1 EMERGENCY GENERATOR DEMOLITION
SCALE: NONE



C3 FUEL OIL SUPPLY AND RETURN PIPING DEMOLITION PLAN
SCALE: 1/8" = 1'-0"



A1 FUEL OIL SUPPLY AND RETURN PIPING DEMOLITION ELEVATION
SCALE: NONE



A3 FUEL OIL SUPPLY AND RETURN PIPING DEMOLITION ELEVATION
SCALE: NONE

SHEET NOTES

1. EXISTING BOILER #1: SHALL REMAIN UNTOUCHED.
2. EXISTING BOILER #2: REPLACE NO. 5 OIL PIPING WITH NO. 2 OIL PIPING. SEE NEW PIPING PLAN SHEET ME101.
3. EXISTING BOILER #3: SHALL REMAIN UNTOUCHED.
4. CUT EXISTING OIL SUPPLY LINE AT EXISTING CONNECTION TO MAIN AND CAP. REMOVE ALL EXISTING OIL PIPING, FITTINGS, VALVES ETC. FROM THIS POINT TO BURNER PIPING OIL CONNECTION. SEE DEMOLITION PHOTOGRAPHS A1 AND A3 THIS SHEET. FIELD VERIFY EXACT LOCATION.
5. CUT EXISTING OIL RETURN LINE AT EXISTING CONNECTION TO MAIN AND CAP. REMOVE ALL EXISTING OIL PIPING, FITTINGS, VALVES, ETC. FROM THIS POINT TO BURNER PIPING OIL CONNECTION. SEE DEMOLITON PHOTOGRAPHS A1 AND A3 THIS SHEET. FIELD VERIFY EXACT LOCATION.
6. SEE SHEET ME101 NOTE 16 FOR CHANGES TO EXISTING BURNER.
7. EXISTING NO. 5 FUEL OIL SUPPLY AND RETURN PIPING HEADERS SHALL REMAIN TO SERVE BOILERS NO. 1 AND NO. 3.

PHOTOGRAPHS DETAIL NOTES:

1. REMOVE EXISTING #5 FUEL OIL PIPING, VALVES, FITTINGS, ETC. FROM CONNECTIONS AT MAIN TO CONNECTIONS TO BURNER MANUFACTURER'S PIPING CONNECTIONS.
2. BURNER MANUFACTURERS PIPING SHALL BE TAKEN APART AND CLEANED. REMOVE AS MUCH OF THE #5 FUEL OIL AS POSSIBLE. REASSEMBLE BURNER MANUFACTURER'S PIPING, VALVES, CONTROLS ETC. BURNER REP SHALL INSPECT PIPING AND START THE BURNER USING THE NEW #2 OIL. CONTACT ALLEN WOODBURY OF NORTH ASSOCIATES- (801) 274-3333 FOR COST QUOTE.
3. EXISTING NEBRASKA BOILER.
4. EXISTING COEN BURNER AND PANEL.
5. PROVIDE PIPE CAP FOR BOTH SUPPLY AND RETURN #5 FUEL OIL PIPING AT CUT NEXT TO MAIN. FIELD VERIFY SIZE. RECORD DRAWINGS INDICATE 1-1/2" DIAMETER PIPING.
6. EXISTING UNISTRUT SHALL REMAIN FOR NEW #2 FUEL OIL PIPING.
7. REMOVE EXISTING EMERGENCY GENERATOR, CONDUIT, WIRING, SWITCH ETC. SEE ELECTRICAL DRAWINGS.
8. EXISTING NO. 5 FUEL OIL SUPPLY AND RETURN PIPING HEADERS SHALL REMAIN TO SERVE BOILERS NO.1 AND NO. 3.

State of Utah
Department of Administrative Services

Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267

Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

PROJECT NAME & ADDRESS

SOUTHERN UTAH UNIVERSITY HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

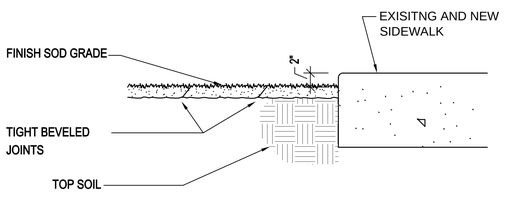
Cedar City, Utah 84720

MARK	DATE	REVISION

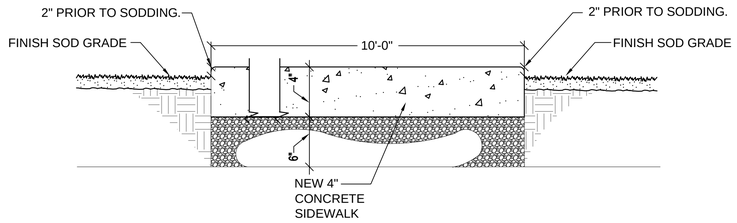
PROJECT MANAGER: WP
DRAWN BY: STAFF
CHECKED BY: SLW
DATE: 12/22/06
WHW JOB NO.: 06024

SHEET TITLE
AREA AND BOILER ROOM DEMOLITION PLAN

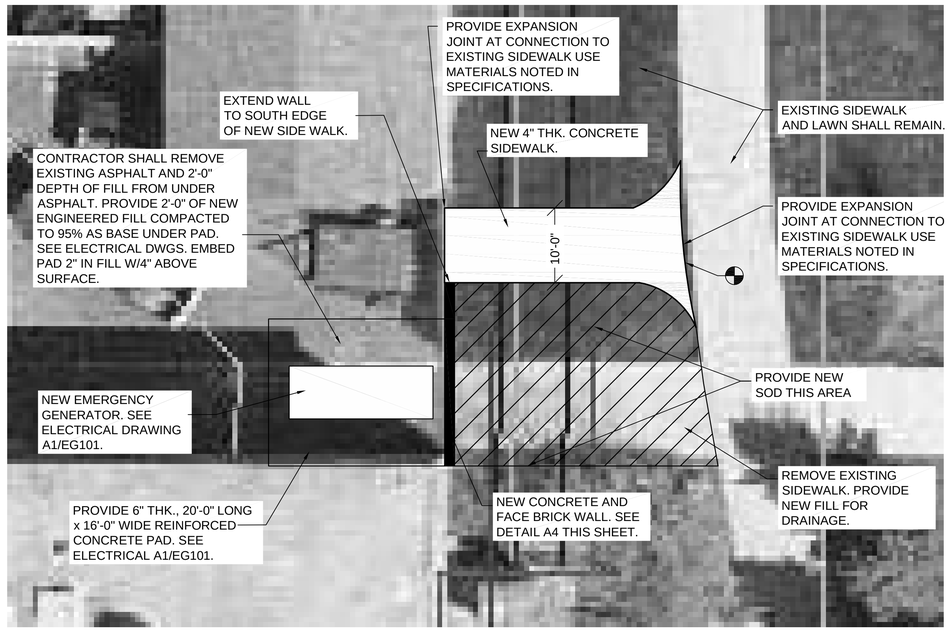
SHEET NO.
MD101



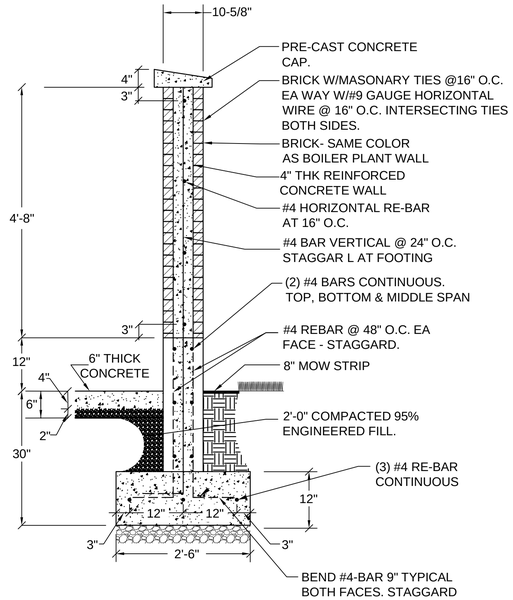
C1 SOD INSTALL DETAIL
SCALE: NONE



C2 CONCRETE SIDEWALK DETAIL
SCALE: NONE



A2 NEW GENERATOR AND SIDEWALK PLAN
SCALE: NONE



A4 GENERATOR PAD WALL DETAIL
SCALE: 3/4" = 1'-0"

SHEET NOTES

1. FIELD VERIFY ALL DIMENSIONS AND LOCATIONS IN FIELD. SEE DWGS C101 AND ME101 FOR OVERALL SITE PLAN AND SCOPE OF PROJECT.

State of Utah
Department of Administrative Services
Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267
Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

PROJECT NAME & ADDRESS

SOUTHERN UTAH UNIVERSITY HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

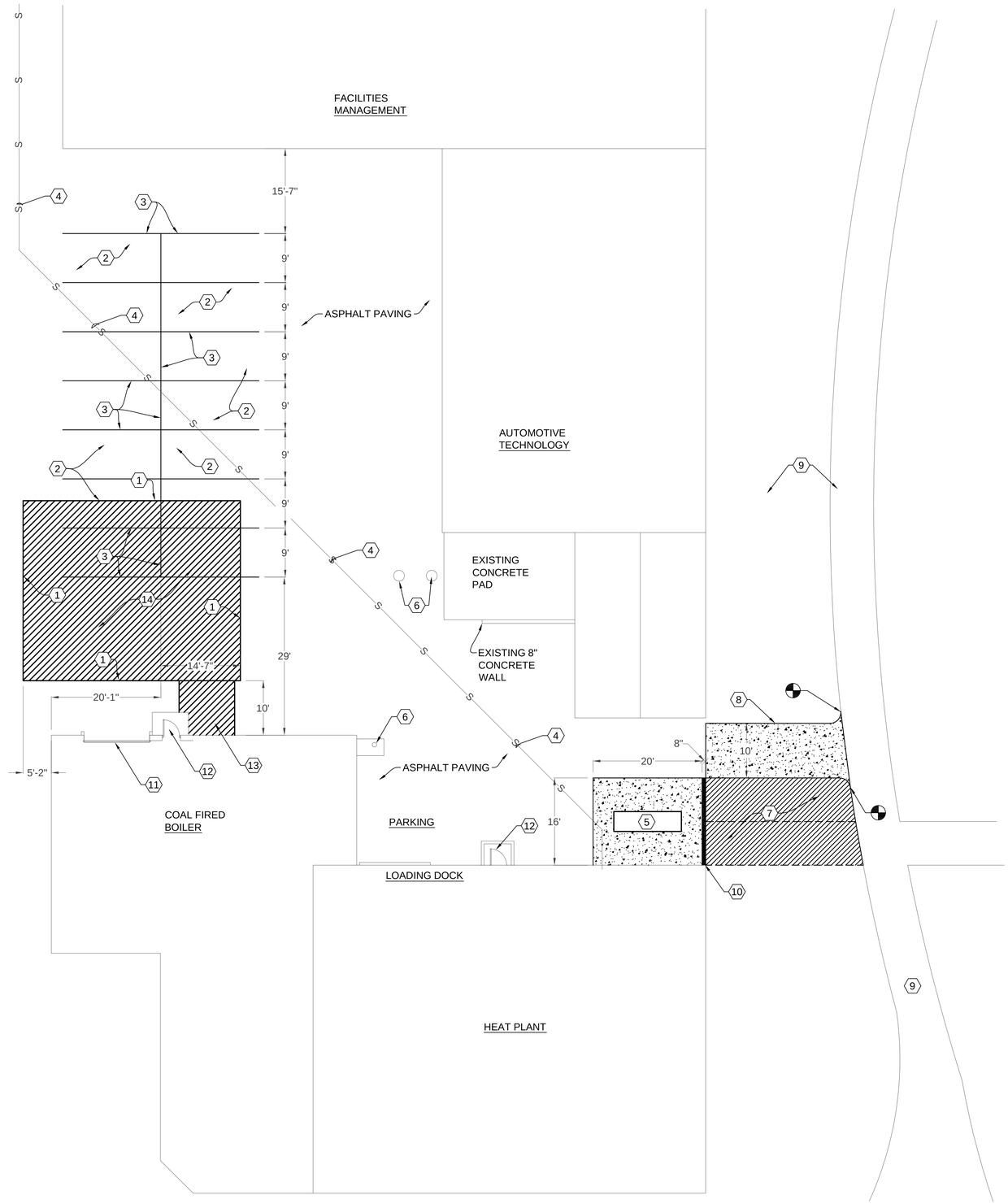
Cedar City, Utah 84720

MARK	DATE	REVISION

PROJECT MANAGER: WP
DRAWN BY: STAFF
CHECKED BY: SLW
DATE: 12/22/06
WHW JOB NO.: 06024

SHEET TITLE
LANDSCAPE PLANS & DETAILS

SHEET NO.
LI101



A2 EXCAVATION LOCATION
SCALE: 1" = 20'-0"

SHEET NOTES

1. EDGE OF TANK EXCAVATION. SEE SHEET ME101 FOR TANK LOCATIONS WITHIN THE EXCAVATION.
2. PARKING AREA FOR REPAIR AUTOMOBILES FOR THE AUTOMOTIVE TECHNOLOGY CLASSES.
3. STRIPE PARKING AREA TO MATCH EXISTING STALLS. FIELD VERIFY STRIPING LOCATIONS. STRIPING SHALL MATCH CAMPUS STANDARDS OR UDOT.
4. EXISTING SEWER LINE. FIELD VERIFY LOCATION BY CUT LINES IN ASPHALT. AVOID AND PROTECT SEWER LINE DURING EXCAVATION. CONTRACTOR SHALL MAKE ALL REPAIRS TO DAMAGED PIPING AND SURROUNDING AREAS CAUSED BY CONTRACTOR'S EMPLOYEE'S .
5. NEW EMERGENCY GENERATOR AND CONCRETE PAD. SEE ELECTRICAL DRAWINGS.
6. EXISTING MANHOLES.
7. REMOVE EXISTING SIDEWALK. REPLACE WITH NEW FILL, TOPSOIL AND SOD. GRADE FOR POSITIVE DRAINAGE.
8. PROVIDE NEW 10'-0" WIDE X 4" THICK CONCRETE WALK. SEE A2/LI101.
9. EXISTING SIDEWALK AND LAWN SHALL REMAIN.
10. NEW 8" CONCRETE AND FACE BRICK WALL. SEE DETAIL A4/LI101. NORTH EDGE SHALL END AT THE SOUTH SIDE OF NEW SIDEWALK.
11. EXISTING ROLL-UP DOOR SHALL REMAIN.
12. EXISTING MAN DOOR AND CONCRETE APRON SHALL REMAIN.
13. PIPING EXCAVATION.
14. TANK EXCAVATION.

State of Utah
Department of Administrative Services

Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267

Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

PROJECT NAME & ADDRESS

SOUTHERN UTAH UNIVERSITY HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

Cedar City, Utah 84720

MARK	DATE	REVISION

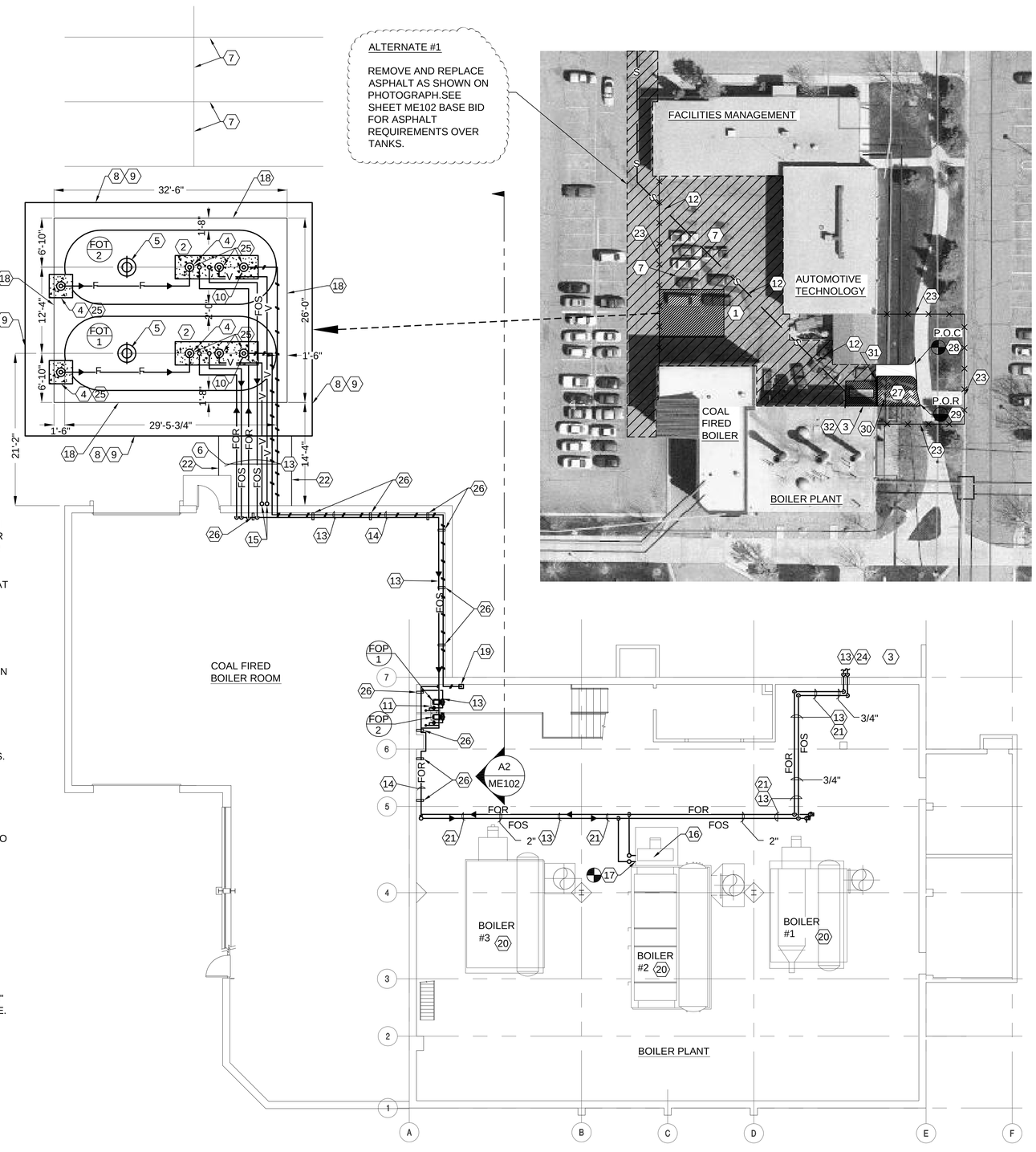
PROJECT MANAGER: WP
DRAWN BY: STAFF
CHECKED BY: SLW
DATE: 12/22/06
WHW JOB NO.: 06024

SHEET TITLE
LANDSCAPE PLANS & DETAILS

SHEET NO.
C101

ALTERNATE #1

REMOVE AND REPLACE ASPHALT AS SHOWN ON PHOTOGRAPH.SEE SHEET ME102 BASE BID FOR ASPHALT REQUIREMENTS OVER TANKS.



SHEET NOTES CONTINUED

23. PROVIDE FENCE LINE AND GATE COMPLETE WITH WARNING SIGNAGE. COORDINATE FENCE LOCATION WITH SUU.
24. PENETRATE FOUNDATION WALL WITH NEW FUEL OIL PIPING TO GENERATOR DAY TANK. SEE DETAIL A1/ME502 FOR WALL SEAL AND ELECTRICAL DRAWINGS FOR GENERATOR DETAIL. PROVIDE BALL VALVES AND UNIONS AT CONNECTIONS.
25. SPILL CONTAINMENT. SEE DETAIL B2/ME503.
26. NEW PIPING SUPPORTS. SEE DETAIL A4/ME504.
27. REMOVE EXISTING SIDEWALK, LAWN IN THIS AREA. PROTECT AND RE-USE SPRINKLING SYSTEM. ADJUST EXISTING SPRINKLING SYSTEM TO MATCH NEW FILL AND GRADING FOR DRAINAGE PURPOSED. COORDINATE WITH UNIVERSITY FOR SPRINKLING SYSTEM MATERIALS AND STANDARDS. SEE BLOW-UP OF THIS AREA SHEET LI101.
28. PROVIDE NEW 4" THICK CONCRETE SIDEWALK. SEE SECTION/DETAIL C2/LI101.
29. FINISH CONCRETE AT CONNECTION TO NORTH SOUTH SIDEWALK AFTER BRANCH SIDEWALK IS REMOVED.
30. PROVIDE NEW TOP SOIL TO RAISE GRADE FOR DRAINAGE PURPOSES. RE-USE SPRINKLING SYSTEM TO MATCH NEW RAISED AREA. PROVIDE NEW SOD IN AREAS SOUTH OF NEW SIDEWALK TO SOUTH END OF REMOVED SIDEWALK.
31. NEW 6'-0" HIGH BRICK WALL. SEE DETAIL A4/LI101.
32. NEW 6" THICK CONCRETE PAD WITH 4" EXTENDED ABOVE ASPHALT SURFACE. SEE ELECTRICAL DRAWINGS.

AREA TANKS AND PIPING PLAN

SCALE: 1/8" = 1'-0"

SHEET NOTES

1. AREA OF NEW UNDERGROUND FUEL OIL STORAGE TANKS.
2. NO. 2 FUEL OIL FRP DOUBLE WALL STORAGE TANK, 15,000 GAL. 29'-5-3/4" LONG x 10'-4" DIAMETER. SEE DETAILS ON SHEET ME501.
3. AREA OF NEW EMERGENCY GENERATOR SEE ELECTRICAL.
4. 4" FILL POINT SPILL CONTAINMENT AND LOCKING COVER. SEE DETAIL B2/ME503.
5. 40"Ø DIAMETER MANHOLE COVER SEE DETAIL A1 & A3/ME501.
6. BURIED PIPING FROM UNDERGROUND STORAGE TANKS TO BOILER ROOM. PIPING LOCATIONS MAY HAVE TO BE ADJUSTED EAST. FIELD VERIFY BEST LOCATION TO ENTER BUILDING.
7. AFTER TANKS ARE INSTALLED, BACKFILLED AND ASPHALT IN PLACE, CONTRACTOR SHALL PAINT PARKING STALLS. BOTH EXISTING AND NEW. STRIPING SHALL MATCH CAMPUS STANDARDS OR UDOT.
8. CUT EXISTING ASPHALT PAVING 5'-2" FROM ALL EDGES OF TANK. SEE SHEET ME501 DETAILS A1 & A3.
9. FENCE AREA AROUND EXCAVATION AND POST WARNING AND KEEP OUT SIGNS. COORDINATE WITH THE UNIVERSITY FOR LAYOUT OF FENCE TO INSURE THAT MAJOR TRAFFIC AREAS ARE NOT CUT-OFF.
10. LOCKED LID ACCESS TO TANK MONITORING SYSTEM. MANWAY ACCESS SHALL BE 12" DIAMETER. SEE DETAIL C1/ME501.
11. NEW PAD MOUNTED POSITIVE DISPLACEMENT FUEL OIL PUMPS. SEE DETAIL C4/ME503.
12. EXISTING SEWER LINE. FIELD VERIFY LOCATION. AVOID AND PROTECT DURING EXCAVATION.
13. SEE PIPING ISOMETRIC SHEET ME901.
14. F.O.S. ROUTED UNDER F.O.R. SEE PHOTOGRAPH C1/ME102.
15. INSTALL 2" VENT PIPING. ROUTE UP OUTSIDE WALL. TERMINATE 12'-0" ABOVE GRADE WITH VENT CAP. SEE ME102 AND DETAILS B1 & C1/ME502.
16. TO CONVERT EXISTING #5 AND #6 FUEL OIL GUN TO FIRE #2 FUEL OIL, CONTRACTOR SHALL PROVIDE THE FOLLOWING:
    a. JUMPER OUT THE EXISTING OIL TEMPERATURE LIMITS.
    b. DISCONNECT THE EXISTING OIL RECIRCULATION VALVE.
    c. PROVIDE AND INSTALL NEW RE-MIX NOZZLE BODY.
    d. PROVIDE AND INSTALL NEW NOZZLE CAP.
    e. PROVIDE AND INSTALL NEW OIL RESTRICTOR.
    f. REUSE ELECTRICAL PER DRAWINGS PROVIDED BY COEN.
    g. AFTER CONVERSION PROVIDE TRIAL CAPS IF REQUIRED.
    h. CONTACT ALLAN WOODBURY OF NORTH ASSOCIATES- (801) 274-3333 OFFICE (801) 918- 4826 CELL. FOR PART NUMBERS, COSTS, ELECTRICAL DRAWINGS, INSPECTION AND START-UP SERVICE.
17. CONNECT TO EXISTING BURNER PIPING AFTER EXISTING PIPING HAS BEEN REMOVED, CLEANED OF #6 FUEL OIL, RE-INSTALLED AND APPROVED BY ENGINEER AND BURNER MANUFACTURER. SEE SHEET ME901 FOR PIPING ISOMETRICS.
18. EDGE OF UNDERGROUND CONCRETE HOLD DOWN PAD.
19. TANK MONITORING PANEL FOR TANKS FOT-1 & FOT-2. SEE DETAIL C2/ME503.
20. EXISTING BOILERS.
21. ROUTE THIS SECTION OF NEW NO 2 FUEL OIL PIPING ON OR BELOW EXISTING HORIZONTAL TRAPEZE HANGERS. FIELD VERIFY BEST LOCATIONS FOR NEW PIPING.
22. CUT EXISTING ASPHALT PAVING 2'-0" BEYOND LAST PIPE OR CONDUIT.

State of Utah
Department of Administrative Services

Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267

Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

PROJECT NAME & ADDRESS

SOUTHERN UTAH UNIVERSITY HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

Cedar City, Utah 84720

MARK	DATE	REVISION

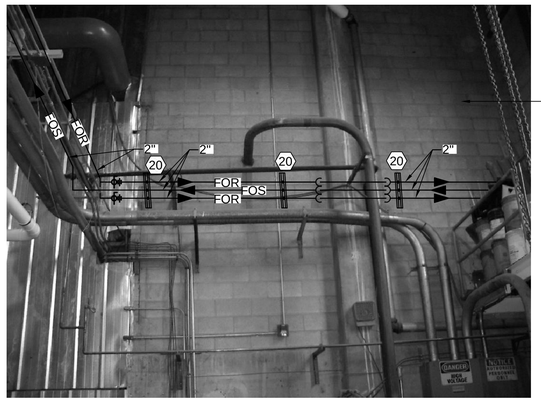
PROJECT MANAGER: WP
DRAWN BY: STAFF
CHECKED BY: SLW
DATE: 12/22/06
WHW JOB NO.: 06024

SHEET TITLE

AREA TANKS AND PIPING PLAN

SHEET NO.

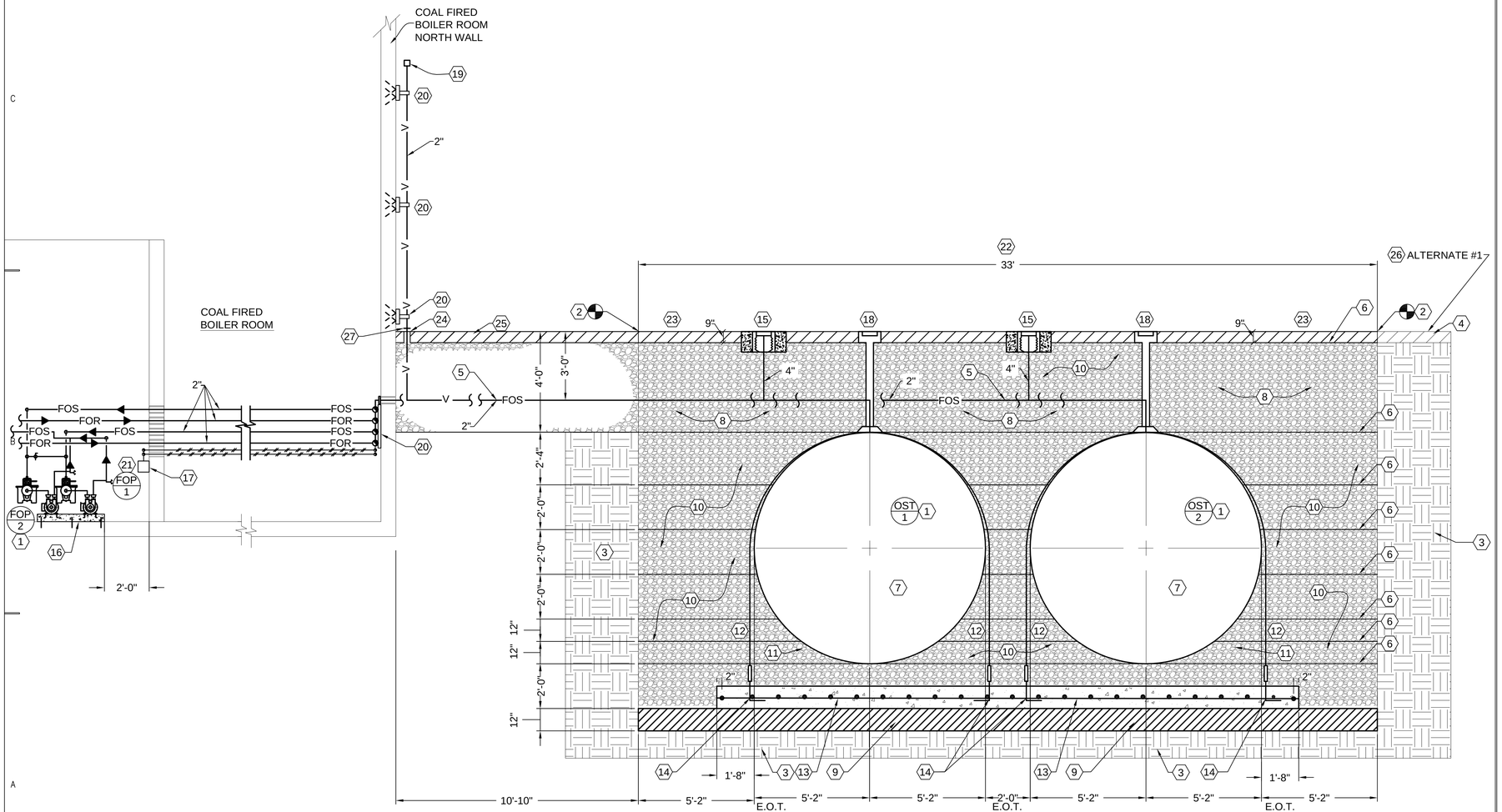
ME101



WEST WALL BETWEEN OIL/GAS BOILERS AND COAL FIRED BOILER

C1 NEW FUEL OIL PIPING ALONG WEST WALL

SCALE: NONE



A2 TANKS AND BOILER ROOM ELEVATION

SCALE: 3/8" = 1'-0"

SHEET NOTES CONT.

22. EXCAVATION, SHORING, EMPLOYEE AND CAMPUS PERSONNEL PROTECTION SHALL BE PROVIDED BY THE CONTRACTOR PER OSHA STANDARDS. THESE STANDARDS SHALL BE DISCUSSED AT THE PRECONSTRUCTION MEETING BETWEEN ALL CONTRACTORS, DFCM, SUU AND ENGINEERS. EXCAVATION SHALL NOT START UNTIL ALL ISSUES HAVE BEEN SATISFIED, SAFETY ISSUES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
23. NEW ASPHALT PAVING SHALL BE 9" THICK.
24. SEAL AROUND 2" VENT PIPING PENETRATION THRU ASPHALT.
25. REPLACE EXISTING ASPHALT IN THIS AREA ONLY WHERE EXISTING ASPHALT WAS REMOVED FOR PIPING INSTALLATION. BASE BIDD.
26. REMOVE AND REPLACE ASPHALT TO THE POINT SHOWN ON SHEET ME101. SEE NOTE 23 & 25 ABOVE THIS SHEET FOR BASE BID ASPHALT INSTALLATION.
27. FRP TO STEEL ABOVE GRADE.

ALTERNATE #1

SHEET NOTES

1. OIL STORAGE TANKS - DOUBLE WALL FRP CONSTRUCTION, 15,000 GALLON STORAGE, 10'-4"Ø X 29'-5-3/4" LONG.
2. CUT INTO EXISTING ASPHALT PAVING FOR PIT EXCAVATION. EXCAVATION AREA SHALL BE 39'-10" X 33'-0" X 17'-4" DEEP.
3. UNDISTURBED SOIL.
4. EXISTING ASPHALT PAVING BEYOND CUT LINE SHALL REMAIN. MAKE NEW TRANSITION CONNECTION BETWEEN EXISTING AND NEW ASPHALT AS REQUIRED BY THE SPECIFICATIONS. BASE BID. SEE NOTE 26 THIS SHEET FOR ALTERNATE #1.
5. ALL BURIED FUEL OIL AND VENT PIPING SHALL BE DOUBLEWALL WITH MONITORING CABLE IN INTERSTITIAL SPACE.
6. DARK LINES INDICATE LAYERS FOR BACKFILL. THESE LAYERS SHALL EACH BE COMPACTED TO 95%. THE FIRST TWO 12 INCH LAYERS SHALL BE PLACED AS REQUIRED BY NOTE 11 THIS SHEET AND PARAGRAPH E NOTE 6 AND 7 SHEET ME-502.
7. SEE SHEET ME-502 FOR STORAGE TANK INSTALLATION GUIDELINES AND TESTING.
8. SEE SHEET ME-502 PARAGRAPH I "BACKFILLING TO GRADE."
9. PROVIDE 12" OF ENGINEERED FILL UNDER CONCRETE PAD DO NOT USE SOIL REMOVED FROM EXCAVATION. ENGINEERED FILL SHALL BE PLACED AS SHOWN AT A MOISTURE CONTENT WITHIN 2 PERCENT OF THE OPTIMUM MOISTURE CONTENT AND COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557.
10. APPROVED BACKFILL MATERIAL SHALL BE WASHED, FREE FLOWING, FREE OF ICE, SNOW, AND DEBRIS PEA GRAVEL. PEA GRAVEL SHALL BE A MIX OF ROUNDED PARTICLES, SIZE BETWEEN 1/8" AND 5/8" AND SHALL CONFORM TO THE SPECIFICATION OF ASTM C-33.
11. PROVIDE ONE (12") LIFT OF PEA GRAVEL EVENLY AROUND BOTTOM OF TANK. PUSH, FROM ABOVE, WITH A NONMETAL PROBE LONG ENOUGH TO REACH BENEATH THE TANK. WORK THE BACKFILL MATERIAL UNDER THE TANK BODY SO THE TANK IS FULLY SUPPORTED ON THE FILL WITHOUT ANY VOIDS UNDER THE TANK. DO NOT STRIKE THE TANK WITH THE PROBE. COMPACT TO 95%.
12. PROVIDE 4 HOLD-DOWN STRAPS ON EACH TANK. INSTALL WHERE MARKED ON THE TANK. DO NOT PLACE STRAPS BETWEEN RIBS. STRAPS SHALL BE 1/2" DIAMETER WITH 1-1/4" HOOK, 3/4" JAW AND EYE. USE A DROP-FORGED TURNBUCKLE. ALL METAL PARTS SHALL BE COATED.
13. 12" THICK X 26'-0" WIDE X 32'-6" LONG REINFORCED CONCRETE HOLD DOWN PAD WITH #4 REBAR @ 12" O.C. BOTH DIRECTIONS. TERMINATE REBAR 2" FROM EDGES OF PAD.
14. SEE DETAIL A1/ME501 FOR HOLD DOWN STRAP AND TURNBUCKLE DETAILS.
15. TANK FILL CONNECTION, SPILL CONTAINMENT AND ACCESS. SEE DETAIL B2/ME503.
16. PROVIDE 3'-0" W X 1'-4" L X 4" THICK CONCRETE PAD. FIELD VERIFY LOCATION WITH ENGINEER AND SUU AT SITE, TO BEST DETERMINE LOCATION OF PUMPS WITHIN ALL EXISTING TANKS, PIPING ETC. SEE PUMP DETAIL C4/ME503. DOWELL INTO EXISTING CONCRETE FLOOR AT CORNERS.
17. LEAK DETECTION AND TANK LEVEL PANEL. FIELD VERIFY WITH SUU FOR BEST LOCATION. DESIGN IS BASED AROUND VEEDER ROOT AUTOMATIC TANK GAUGING SYSTEM. SEE DETAIL C2/ME503.
18. LEAK DETECTION AND TANK LEVEL ACCESS. SEE DETAIL C1/ME501 FOR FUEL OIL TANK MONITORING SYSTEM.
19. 2" VENT TERMINATION CAP. SEE DETAIL B1/ME502.
20. PROVIDE 1-5/8" UNISTRUT P-1000 PIPE SUPPORT WITH PIPE CLAMPS. BOLT INTO EXISTING WALL WITH EXPANSION BOLTS. SEE DETAIL A4/ME503.
21. POSITIVE DISPLACEMENT OIL TRANSFER PUMPS (FOP-1&2). SEE DETAIL C4/ME-503 AND SCHEDULE ME601. THE # OF THE PUMP CORRESPONDS WITH THE NUMBER OF THE STORAGE TANK. PROVIDE BYPASS AS SHOWN ON THE ISOMETRICS SO EACH PUMP CAN DRAW FROM EITHER TANK IN CASE OF PUMP FAILURE.

State of Utah
Department of Administrative Services

Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267

Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

PROJECT NAME & ADDRESS

SOUTHERN UTAH UNIVERSITY HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

Cedar City, Utah 84720

MARK	DATE	REVISION

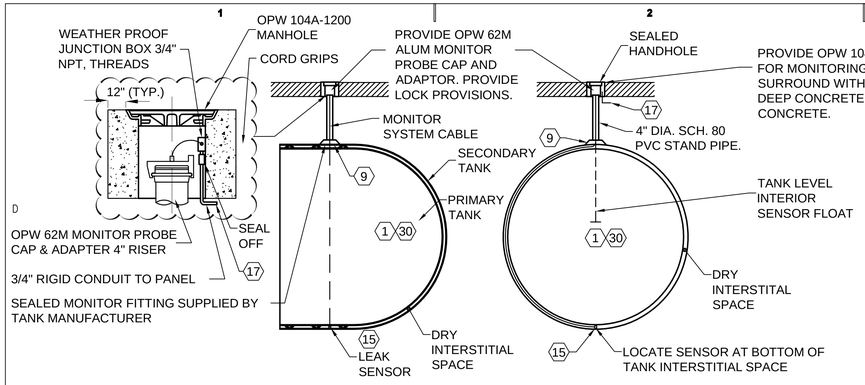
PROJECT MANAGER: WP
DRAWN BY: STAFF
CHECKED BY: SLW
DATE: 12/22/06
WHW JOB NO.: 06024

SHEET TITLE

TANKS AND BOILER ROOM ELEVATION

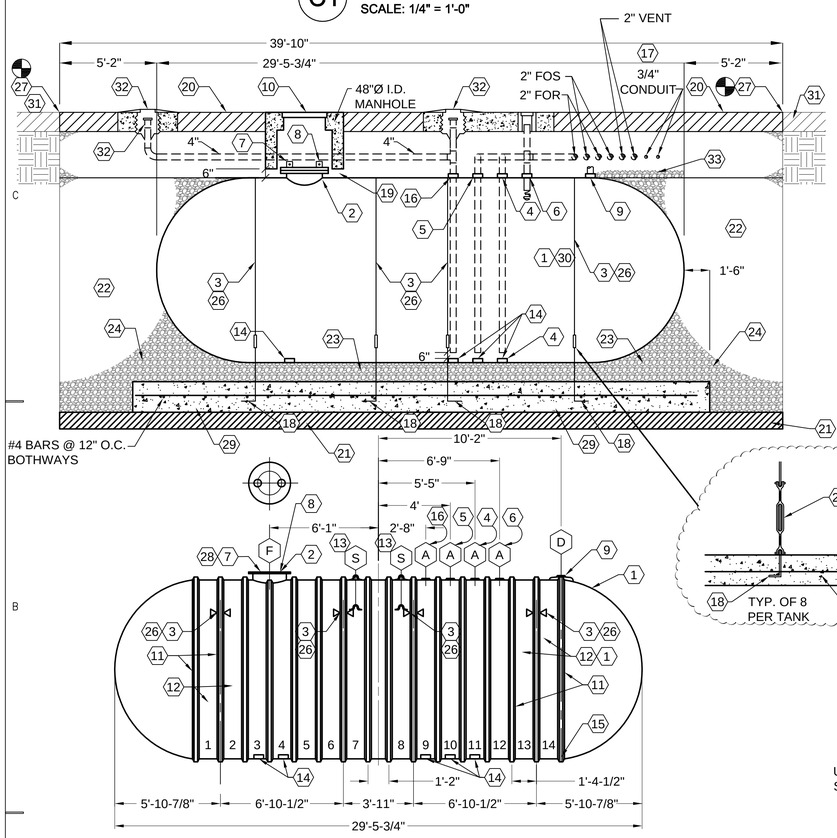
SHEET NO.

ME102



C1 FUEL OIL TANK MONITORING SYSTEM

SCALE: 1/4" = 1'-0"

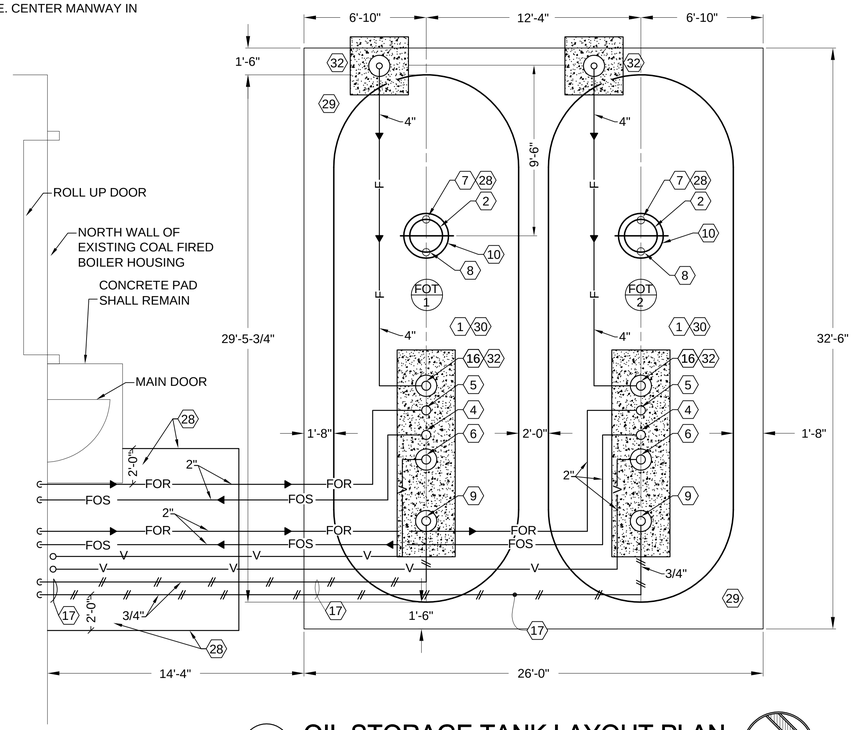


A	4" NPT SERVICE FITTING WITH 12"x12" GAUGE PLATE
D	4" NPT MONITOR FITTING. SEE DETAIL C1 THIS SHEET
F	22" DIA. MANWAY WITH 2-4" NPT FITTINGS IN COVER & 4-12"x12" GAUGE PLATES DIAM OF COVER 28", 26" DIA BOLT CIRCLE, 3/4" DIAM BOLT HOLES FOR 5/8" BOLT SIZE, 24 BOLTS REQUIRED.
S	LIFTING LUG (4 LUGS REQUIRED TOTAL) (13)
	HOLD DOWN STRAP LOCATION

(1) ALL COVERS SHALL BE PROVIDED WITH 3/8" NPT PLUG FOR DRAINAGE DURING TANK TESTING.

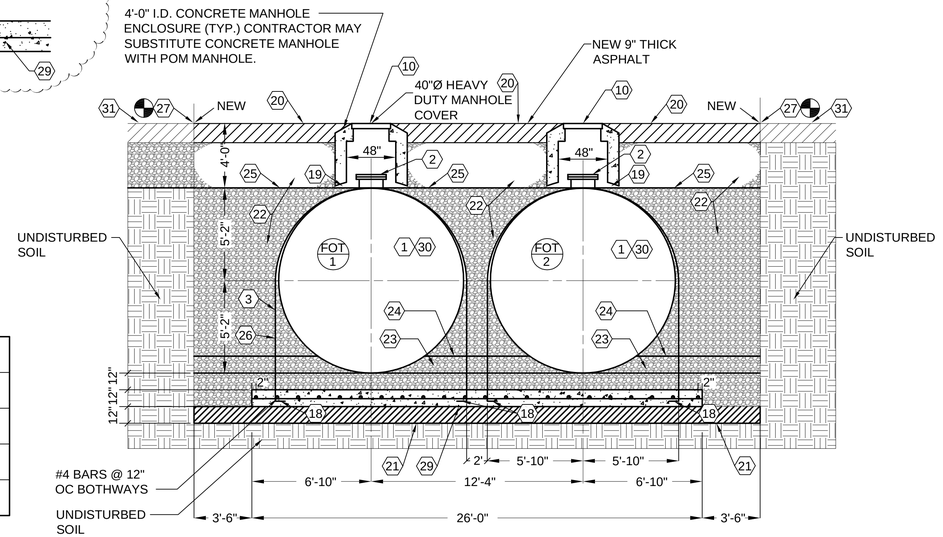
A1 OIL STORAGE TANK FITTINGS AND ACCESSORIES

SCALE: 1/4" = 1'-0"



B3 OIL STORAGE TANK LAYOUT PLAN

SCALE: 1/4" = 1'-0"



A3 INSTALLATION ELEVATION AND ANCHOR OF OIL STORAGE TANKS

SCALE: NONE

SHEET NOTES

1. UNDERGROUND DOUBLE- WALL FIBERGLASS REINFORCED PLASTIC (FRP) STORAGE TANK. 15,000 GAL.- 29'-5-3/4" LONG x 10'-4" DIAMETER.
2. TANK MANWAY- FLANGED, 22" I.D., COMPLETE WITH UL - LISTED GASKETS, BOLTS AND COVERS AND TWO - 4" FITTINGS.
3. ANCHOR STRAPS SHALL BE PROVIDED BY TANK MANUFACTURER. STRAPS SHALL BE FRP, FOUR STRAPS PER TANK.
4. 4" NPT THREADED FITTING FOR FUEL OIL SUPPLY (F.O.S.) PROVIDE 4"x2" REDUCER. PROVIDE SINGLE POPPET FOOT VALVE.
5. 4" NPT THREADED FITTING FOR FUEL OIL RETURN (F.O.R.) PROVIDE 4"x2" REDUCER.
6. 4" NPT THREADED FITTING FOR VENT AND EXTRACTOR FOR VENT PIPING. SEE DETAIL C1/ME502.
7. 4" NPT THREADED FITTING FOR SOUNDING/INVENTORY LINE.
8. 4" NPT THREADED FITTING FOR FUTURE. PROVIDE 4" NIPPLE AND CAP.
9. 4" NPT THREADED FITTING FOR LEAK DETECTION. SEE DETAIL C1/ME501.
10. 40" SURFACE MOUNTED MANHOLE COVER. SEE TANK SECTION.
11. TANK RIBS. (TYPICAL)
12. TANK FLAT SPACE BETWEEN RIBS. (TYPICAL)
13. TANK LIFTING LUGS.
14. GAUGE PLATES BY TANK MANUFACTURER.
15. ELECTRONIC SENSOR IN INTERSTITIAL SPACE.
16. 4" NPT THREADED FITTING FOR FUEL OIL TANK FILL. SEE DETAIL B2/ME503.
17. ROUTE SENSOR CABLE UNDERGROUND IN 3/4" CONDUIT TO BUILDING MONITORING PANEL.
18. EXTEND 1/2" BAR UNDER REBAR WITH 12" LONG "L".
19. PROVIDE A MINIMUM SPACE OF 6" BETWEEN BOTTOM OF THE MANHOLE AND THE TOP OF THE TANK.
20. 9" THICK ASPHALT.
21. 12" ENGINEERED FILL UNDER CONCRETE PAD. COMPACT TO 95% (D-1557).
22. APPROVED BACKFILL MATERIAL SHALL BE WASHED, FREE FLOWING, FREE OF ICE, SNOW, AND DEBRIS PEA GRAVEL. PEA GRAVEL SHALL BE A MIX OF ROUNDED PARTICLES, SIZE BETWEEN 1/8" AND 5/8" AND CONFORM TO THE SPECIFICATION OF ASTM C-33.
23. PROVIDE ONE (12") LIFT OF PEA GRAVEL EVENLY AROUND BOTTOM OF TANK. PUSH, FROM ABOVE, WITH A NONMETAL PROBE LONG ENOUGH TO REACH BENEATH THE TANK. WORK THE BACKFILL MATERIAL UNDER THE TANK BODY SO THE TANK IS FULLY SUPPORTED ON THE FILL WITHOUT ANY VOIDS UNDER THE TANK. DO NOT STRIKE THE TANK WITH THE PROBE. COMPACT TO 95%.
24. PROVIDE A SECOND (12") LIFT AND COMPACT TO 95%.
25. AFTER COMPACTION OF SECOND LIFT, BRING THE BACKFILL EVEN TO THE TOP OF THE TANK IN LAYERS AND COMPACT TO 95%. SEE SHEET ME102 FOR BACKFILL LAYERS. SEE INSTRUCTIONS PARAGRAPH F/ME502 FOR WHAT TO DO AT THIS POINT.
26. PROVIDE FOUR HOLD-DOWN STRAPS ON EACH TANK. INSTALL WHERE MARKED ON THE TANK. DO NOT PLACE STRAPS BETWEEN RIBS. STRAPS SHALL BE 1/2" DIAMETER WITH 1-1/4" HOOK, 3/4" JAW AND EYE. USE A DROP- FORGED TURNBUCKLE. COAT ALL METAL HOOKS, EYE, ETC. BEFORE BACKFILL.
27. FEATHER NEW ASPHALT PAVEMENT INTO EXISTING ASPHALT PAVEMENT. SEAL JOINT.
28. NEW PEA GRAVEL FILL AROUND AND ON TOP OF PIPING. PROVIDE NEW 9" ASPHALT PAVEMENT. EXCAVATION SHALL BE 2'-0" BEYOND EDGE OF LAST PIPE OR CONDUIT.
29. 12" THICK X 26'-0" WIDE X 32'-6" LONG REINFORCED CONCRETE HOLD DOWN PAD. WITH #4 REBAR @ 12" O.C. BOTH WAYS. TERMINATE REBAR 2" FROM EDGES OF PAD.
30. SEE SHEET ME502 FOR INSTRUCTIONS ON INSTALLING OIL STORAGE TANKS.
31. EXISTING ASPHALT PAVING FROM BEYOND EXCAVATION SHALL REMAIN, EXCEPT WHERE REMOVED FOR PIPING INSTALLATION AND ALTERNATE #1. ASPHALT OVER PIPING SHALL BE 9" THICK.
32. SEE DETAIL B2/ME503 FOR DETAIL OF REMOTE AND ABOVE TANK FILL MANWAY AND SPILL CONTAINERS.

State of Utah
Department of Administrative Services

Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267

Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

PROJECT NAME & ADDRESS

SOUTHERN UTAH UNIVERSITY HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

Cedar City, Utah 84720

MARK	DATE	REVISION

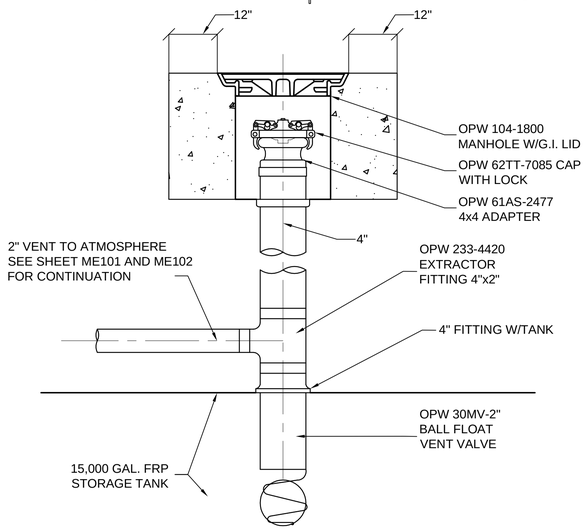
PROJECT MANAGER: WP
DRAWN BY: STAFF
CHECKED BY: SLW
DATE: 12/22/06
WHW JOB NO.: 06024

SHEET TITLE

OIL STORAGE TANK DETAILS AND LAYOUTS

SHEET NO.

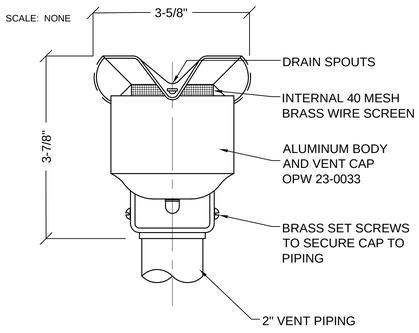
ME501



C1 VENT AND EXTRACTOR DETAIL

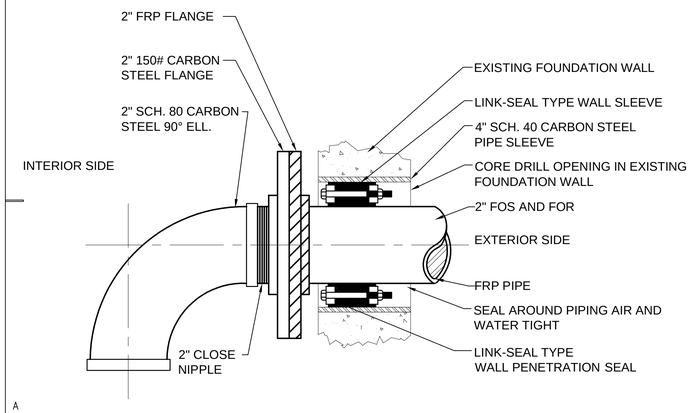
SCALE: NONE

VENT CAP SHALL COMPLY WITH NFPA 30 REQUIREMENTS



B1 VENT TERMINATION DETAIL

SCALE: NONE



A1 SLEEVE THROUGH FOUNDATION WALL DETAIL

SCALE: NONE

OIL STORAGE TANK INSTALLATION GUIDELINES CONT:

6. PLACE ONE 12-INCH LIFT OF APPROVED BACKFILL MATERIAL EVENLY AROUND THE TANK. FROM THE EDGE OF THE HOLE OR THE TOP OF AN ADJACENT TANK, PUSH THE BACKFILL IN PLACE BY USING A NONMETAL PROBE LONG ENOUGH TO REACH BENEATH THE TANK. WORK THE BACKFILL MATERIAL UNDER THE TANK BODY AND DOMES SO THE TANK IS FULLY SUPPORTED - THAT IS, SO THERE ARE NO VOIDS UNDER THE TANK.

7. REPEAT NOTE 6 WITH A SECOND 12-INCH LIFT.

8. AFTER THE SECOND LIFT OF MATERIAL HAS BEEN PLACED AND WORKED UNDER THE TANK, BRING THE BACKFILL TO THE TOP OF THE TANK. SEE SHEETS A3/ME501 AND ME102

F. POST INSTALLATION TESTING

1. TANKS SHALL BE TESTED BEFORE BALLASTING.

2. AFTER BACKFILL IS BROUGHT TO THE TOP OF THE TANK, TAKE A MEASUREMENT OF THE INTERNAL DIAMETER OF THE TANK AS A DEFLECTION CHECK.

3. AFTER THE INTERNAL DIAMETER OF THE TANK HAS BEEN MEASURED AND VERTICAL DEFLECTION IS DETERMINED TO BE WITHIN THE LIMITS SPECIFIED BY TANK MANUFACTURER (SEE E-4 THIS SHEET), THE TANKS SHALL AGAIN BE PRESSURE TESTED TO ENSURE THAT NO DAMAGE OCCURRED DURING INSTALLATION.

4. FOLLOW THE TESTING PROCEDURE NOTED IN SECTION B, 1-4, SOAPING ALL EXPOSED AREAS OF THE TANK AND ALL FITTINGS, AND MONITORING THE PRESSURE FOR ONE HOUR.

5. CAREFULLY RELIEVE THE PRESSURE IN THE TANK. REMOVE THE QUICK-DISCONNECT ASSEMBLY FROM DRY DOUBLE-WALL TANKS.

G. BALLASTING (LIQUID ADDITION)

1. DURING THE INSTALLATION PROCESS, THE TANK SHOULD BE BALLASTED COMPLETELY AFTER THE BACKFILL IS EVEN WITH THE TOP OF THE TANK AND POST INSTALLATION TESTING HAS BEEN SUCCESSFULLY COMPLETED.

H. PIPING

1. SEE DRAWINGS FOR PIPING OF TANKS.

I. BACKFILLING TO GRADE

1. CONTINUE TO TAKE SAFETY MEASURE SUCH AS PLACING BARRICADES AROUND THE EXCAVATION SITE UNTIL INSTALLATION IS COMPLETED.

2. WHEN THE TANK HAS BEEN SET, TESTED AND BACKFILLED, AND ALL PIPING AND VENTING HAS BEEN COMPLETED, ADD THE BALANCE OF THE BACKFILL MATERIAL.

3. THE BACKFILL SHALL BE FREE OF DEBRIS, ICE OR SNOW. ANY BLOCKS OR BRICKS USED AS SUPPORT MATERIAL DURING PIPING SHALL BE REMOVED PRIOR TO COMPLETION OF BACKFILLING.

4. THE BACKFILL MATERIAL SPECIFIED ON THE DRAWINGS SHALL BE USED TO COMPLETELY FILL EXCAVATION.

5. WHEN THE TANKS HAVE BEEN BACKFILLED TO SUBGRADE AND BEFORE PLACEMENT OF ASPHALT, CONTRACTOR SHALL TAKE A MEASUREMENT OF THE INTERNAL DIAMETER OF THE TANK. CONTRACTOR SHALL RECORD THIS MEASUREMENT AS THE FINAL INTERNAL DIAMETER ON THE TANK INSTALLATION.

OIL STORAGE TANK INSTALLATION GUIDELINES CONT:

3. SECONDARY TANK (EXTERNAL)

1. MAINTAIN THE PRESSURE IN THE PRIMARY TANK.
2. DO NOT CONNECT AIR SUPPLY DIRECTLY TO THE INTERSTITIAL-SPACE MONITOR FITTING. PRESSURIZING THE SECONDARY TANK (INTERSTITIAL SPACE) BY ITSELF MAY DAMAGE THE PRIMARY TANK OR CAUSE TANK FAILURE.
3. FREE THE HOSE FROM THE SERVE FITTING BY CUTTING THE NYLON TIE.
4. INSERT THE HOSE INTO THE QUICK-DISCONNECT FITTING. THIS WILL ALLOW AIR TO TRANSFER FROM THE PRIMARY TANK TO THE SECONDARY TANK
5. RECONNECT THE AIR SUPPLY LINE. ALLOW THE PRESSURE TO STABILIZE AT 5 PSIG BY ADDING OR REMOVING AIR AS NECESSARY.
6. CLOSE THE AIR-SUPPLY VALVE ON THE TEST MANIFOLD. DISCONNECT THE AIR-SUPPLY LINE.
7. SOAP THE ENTIRE EXTERIOR OF THE TANK, CHECKING FOR LEAKS. WATCH FOR ACTIVE AIR BUBBLES, WHICH INDICATE A LEAK. PAY SPECIAL ATTENTION TO FITTINGS AND MAN.
8. MONITOR THE PRESSURE FOR ONE HOUR.
9. WHEN THE TEST IS COMPLETE, CAREFULLY RELEASE THE AIR PRESSURE FROM THE TANK BY OPENING THE AIR-SUPPLY VALVE.
10. WHEN THE AIRFLOW STOPS, REMOVE THE TEST MANIFOLD.
11. REPLACE THE PROTECTIVE COVERS IN THE SERVICE FITTINGS.

D. ANCHORING TANKS

1. SEE ANCHORING DETAILS ON THE DOCUMENTS.

2. USE ONLY HOLD-DOWN STRAPS PROVIDED BY THE TANK MANUFACTURER.

3. INSTALL STRAP LOCATIONS ONLY WHERE SHOWN AND APPROVED BY TANK MANUFACTURER. DO NOT PLACE STRAPS BETWEEN THE TANK RIBS.

4. EVENLY DISTRIBUTE LOADS BY TIGHTENING ALL HOLD-DOWN STRAPS UNIFORMLY UNTIL THEY ARE SNUG OVER THE RIBS BUT CAUSE NO DEFLECTION OF THE TANK.

5. TAKE A MEASUREMENT OF THE INTERNAL DIAMETER OF THE TANK TO DETERMINE WHETHER VERTICAL DEFLECTION IS WITHIN THE LIMITS SPECIFIED BY TANK MANUFACTURER AFTER THE STRAPS HAVE BEEN INSTALLED AND TIGHTENED.

6. ANCHORING HARDWARE SHALL BE SIZED AS FOLLOWS: HOOK 1-1/4", JAW 3/4" EYE 3/4". USE A DROP-FORGED TURNBUCKLE AT ALL EIGHT LOCATIONS FOR EACH TANK.

7. ALL METAL ON THE ANCHORING SYSTEM SHALL BE COATED TO PROTECT AGAINST CORROSION.

E. INSTALLATION

1. SEE DRAWINGS FOR BEDDING MATERIAL BETWEEN TOP OF CONCRETE AND BOTTOM OF TANK.

2. PLACE THE TANKS ONTO THE BED. DO NOT SET TANKS DIRECTLY ONTO A CONCRETE SLAB, ON TIMBERS OR CRADLES, OR ONTO THE IN SITU SOIL.

3. USE THE TOPS OF THE TANK RIBS TO ESTABLISH LONGITUDINAL LEVEL. ESTABLISH LATERAL LEVEL BY PLACING THE LEVEL ACROSS THE TOP OF A FITTING OR A MANWAY.

4. WHEN THE TANK IS PLACED, CONTRACTOR SHALL TAKE A MEASUREMENT OF THE INTERNAL DIAMETER OF THE TANK. RECORD THIS MEASUREMENT

5. INSTALL THE ANCHORING HARDWARE AT THIS TIME.

OIL STORAGE TANK INSTALLATION GUIDELINES:

A. UNLOADING AND STORAGE

1. BEFORE THE STORAGE TANKS ARE UNLOADED, CONTRACTOR AND OWNERS REPRESENTATIVE SHALL VISUALLY INSPECT THE ENTIRE EXTERIOR SURFACE OF THE TANK TO MAKE SURE THAT NO SHIPPING OR HANDLING DAMAGE HAS OCCURRED. LOOK PARTICULARLY FOR HOLES, CRACKS OR DEEP SCRAPES.

2. CONTRACTOR SHALL USE TANK UNLOADING AND HANDLING EQUIPMENT THAT IS RATED TO HANDLE THE LOAD. CONTRACTOR SHALL USE THE LIFTING LUGS. DO NOT WRAP CHAIN OR CABLE AROUND THE TANKS. STORE THE TANK IN A SAFE PLACE, AWAY FROM VEHICLE TRAFFIC, STUDENT TRAFFIC, ETC. AREA SHALL BE A LEVEL, SOLID SURFACE, FREE OF ALL ROCKS, TRASH, AND DEBRIS THAT COULD PENETRATE OR DAMAGE THE TANK SURFACE. CHOCK TANK IN PLACE TO PREVENT ROLLING DURING STORAGE.

B. PRE INSTALLATION TESTING

1. TANK SHALL BE RETESTED AT THE SITE PRIOR TO INSTALLATION IN ORDER TO VERIFY THE ABSENCE OF SHIPPING AND HANDLING DAMAGE.

2. CONSTRUCT A TEST MANIFOLD CONSISTING OF TWO AIR-SUPPLY GAUGES. SEE DETAIL A2/ME503. EACH AIR-SUPPLY GAUGE SHALL HAVE A MAXIMUM FULL-SCALE READING OF 15 PSIG WITH 1/4-LB OR 1/10-LB INCREMENTS, AND A PRESSURE-RELIEF DEVICE SET AT 6 PSIG.

3. IF DAMAGE IS DETECTED, CONTRACTOR SHALL NOT ATTEMPT REPAIRS. CONTRACTOR SHALL CONTACT THE UST COORDINATOR AT THE XERXES PLANT IN ANAHEIM, CALIFORNIA AT 1-714-630-0012

4. AFTER INSTALLATION AND BEFORE BACK FILLING TO GRADE, CONTRACTOR SHALL TEST AGAIN TO VERIFY THAT NO DAMAGE HAS OCCURRED DURING INSTALLATION.

C. TESTING

1. STORAGE TANK SHALL COME EQUIPPED WITH A QUICK-DISCONNECT ASSEMBLY.

2. PRIMARY TANK TESTING (INTERNAL)

1. REMOVE ALL TEMPORARY SERVICE-FITTING PLUGS.
2. REDOPE FITTINGS AND INSTALL PLUGS IN ALL OPENINGS, EXCEPT ONE SERVICE FITTING NEEDED FOR THE TEST MANIFOLD.
3. INSTALL THE TEST MANIFOLD NOTED IN B-2 ABOVE, IN THE OPEN SERVICE FITTING. CONNECT THE PRESSURE SOURCE TO THE TEST MANIFOLD.
4. IN ORDER TO TEST THE PRIMARY TANK ALONE, THE QUICK-DISCONNECT ASSEMBLY MUST NOT BE CONNECTED TO THE SERVICE FITTING - KEEP THE NYLON TIE IN PLACE.
5. PRESSURIZE THE PRIMARY TANK TO 5 PSIG. ALLOW THE PRESSURE TO STABILIZE BY ADDING OR REMOVING AIR AS NECESSARY.
6. CLOSE THE AIR-SUPPLY VALVE ON THE TEST MANIFOLD. DISCONNECT THE AIR-SUPPLY LINE.
7. SOAP ALL SERVICE FITTINGS AND MANWAYS. WATCH FOR ACTIVE AIR BUBBLES, WHICH INDICATE A LEAK.
8. MONITOR THE PRESSURE FOR ONE HOUR.

State of Utah
Department of Administrative Services
Division of Facilities
Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267
Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW
ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

PROJECT NAME & ADDRESS

SOUTHERN UTAH UNIVERSITY HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

Cedar City, Utah 84720

MARK	DATE	REVISION

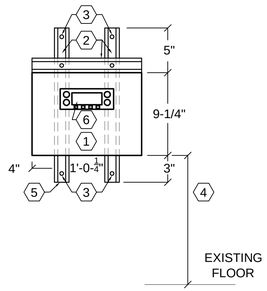
PROJECT MANAGER: WP
DRAWN BY: STAFF
CHECKED BY: SLW
DATE: 12/22/06
WHW JOB NO.: 06024

SHEET TITLE

DETAILS AND OIL STORAGE TANK INSTALLATION GUIDELINES

SHEET NO.

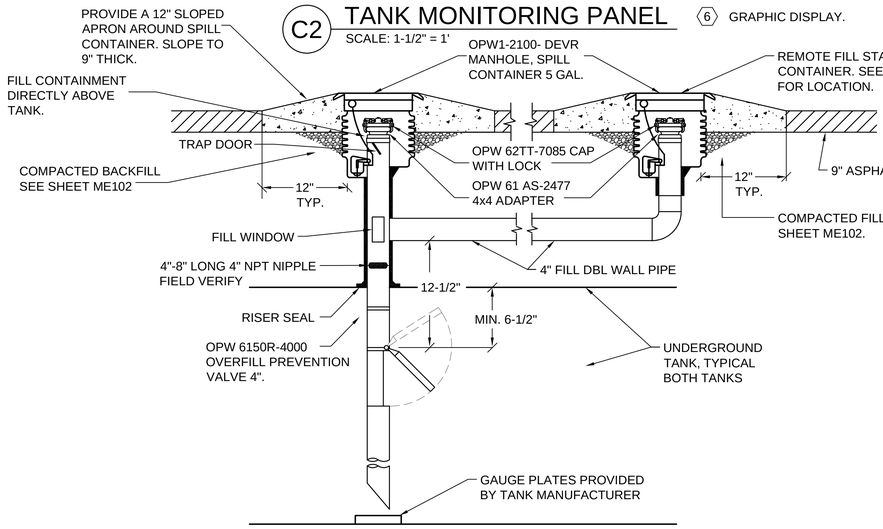
ME502



1. OPW SITE SENTINEL 1 AUTOMATIC TANK GAUGING SYSTEM OR VEEDER ROOT VEE 848290-022 CONSOLE PLUS TLS-350 W/PRINTER.
2. 1-5/8" UNISTRUT P-1000 BOLT VERTICAL UNISTRUT TO EXISTING WALL, STRUCTURAL STEEL ETC. FIELD VERIFY. BOLT HORIZONTAL UNISTRUT TO VERTICLE UNISTRUT.
3. 5/8" ANCHOR BOLT AND NUT.
4. DISTANCE FROM FLOOR TO BOTTOM OF PANELS VARIES WITH EXACT LOCATION OF MONITORS. MINIMUM SHALL BE 54".
5. IF UNISTRUT CANNOT BE BOLTED TO WALL EXTEND UNISTRUT TO FLOOR. PROVIDE FLOOR PLATE AND BOLT INTO FLOOR.
6. GRAPHIC DISPLAY.

C2 TANK MONITORING PANEL

SCALE: 1-1/2" = 1'

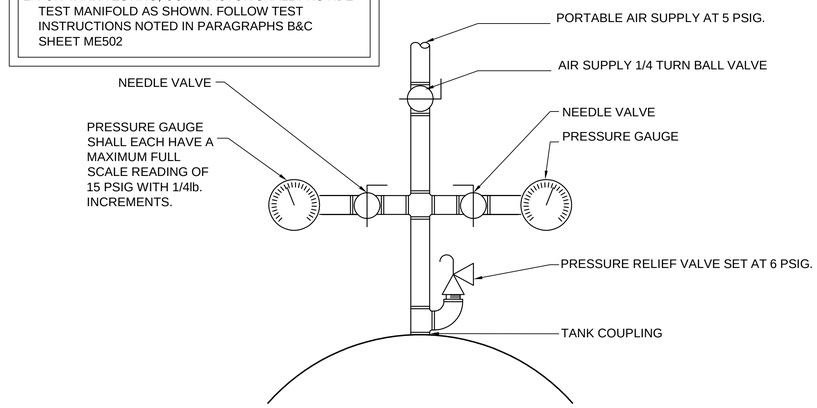


B2 TANK REMOTE FILL AND OVERFILL PREVENTION VALVES DETAIL

SCALE: NONE

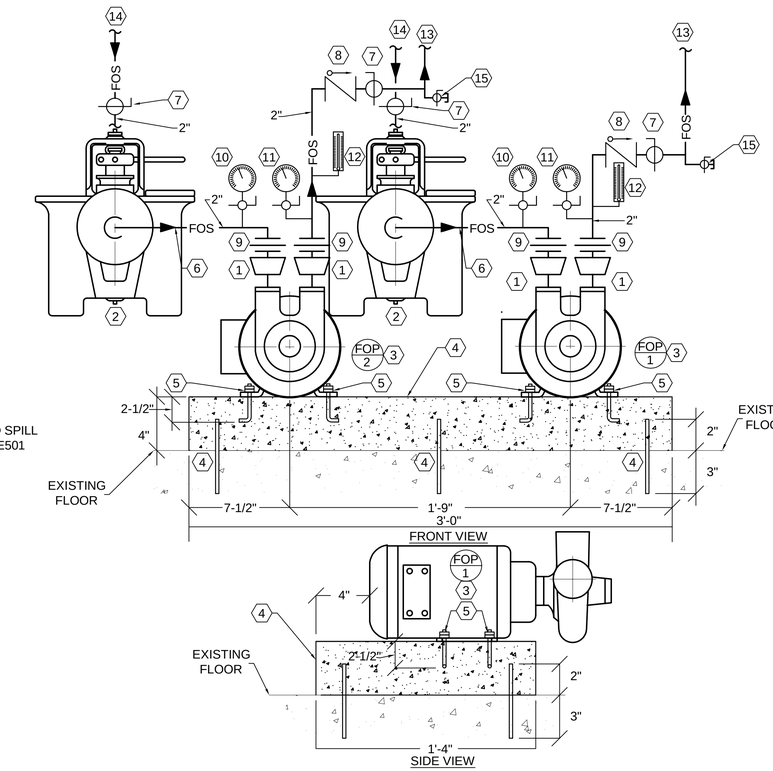
NOTE:

1. FOR TANK TESTING, CONTRACTOR SHALL PROVIDE TEST MANIFOLD AS SHOWN. FOLLOW TEST INSTRUCTIONS NOTED IN PARAGRAPHS B&C SHEET ME502



A2 TANK TEST MANIFOLD DETAIL

SCALE: NONE



NOTE:

1. SEE ISOMETRIC SHEET ME901

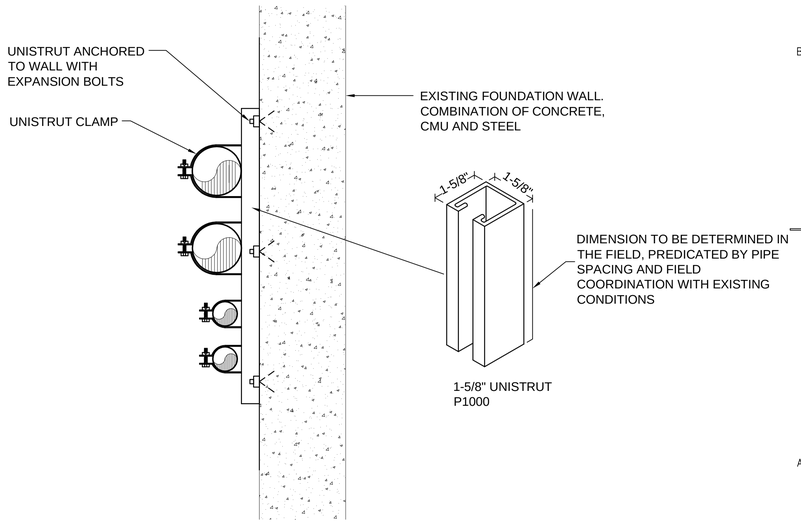
1. 2"x1" CONCENTRIC REDUCER.
2. DUAL BASKET STRAINER TATE ANDALE MODEL ID. 2".
3. FUEL OIL TRANSFER PUMPS.
4. 1'-4"x3'-0"x4" THK CONCRETE PAD. DOWELL INTO EXISTING CONCRETE FLOOR WITH 3/8"Ø STEEL REBAR. DRILL INTO EXISTING FLOOR.
5. BOLT INTO NEW CONCRETE PAD. MATCH BOLT SIZE WITH OPENING IN BASE, PROVIDED BY PUMP MANUFACTURER. USE DOUBLE NUT.
6. SUPPORT PIPING FROM FLOOR.
7. 2" BALL VALVE, FULL PORT, 1/4 TURN.
8. 2" SWING CHECK VALVE.
9. 2" UNION.
10. COMPOUND GAUGE W/ VALVE. 30" OF VACUUM TO 15 PSIG. PUMP SUCTION.
11. PRESSURE GAUGE W/ VALVE. 0 TO 150 PSIG PUMP DISCHARGE.
12. INSTALL THERMOMETER ON EITHER THE SIDE OR DISCHARGE SIDE OF PUMP. ONE ONLY PER PUMP.
13. 2" F.O.S. TO BURNER B-2.
14. 2" F.O.S. FROM UNDERGROUND STORAGE TANKS.
15. PROVIDE 3/4" SAMPLING VALVE, NIPPLE, AND SCREWED CAP ON DISCHARGE LINE.

NOTE:

TUTHILL MODEL 5LE 88606- ASSEMBLY STYLE A PUMP

C4 FUEL OIL TRANSFER PUMP

SCALE: 3/16" = 1"



A4 UNISTRUT DETAIL

SCALE: NONE

State of Utah
Department of Administrative Services
Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267
Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

PROJECT NAME & ADDRESS

SOUTHERN UTAH UNIVERSITY HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

Cedar City, Utah 84720

MARK	DATE	REVISION

PROJECT MANAGER: WP
DRAWN BY: STAFF
CHECKED BY: SLW
DATE: 12/22/06
WHW JOB NO.: 06024

SHEET TITLE

MISCELLANEOUS DETAILS

SHEET NO.

ME503

TANK SCHEDULE

TANK SYMBOL	TANK CAPACITY GALLONS	TANK DIMENSIONS		MANHOLE SIZE DIAMETER	NOZZLES		STRAPS		MANUFACTURER
		LENGTH	DIAMETER		NO.	SIZE	NO.	SIZE	
OST 1	15,000	29'-5-3/4"	10'-4"	22" (5)	4	4"	4	1/2"	XERXES
OST 2	15,000	29'-5-3/4"	10'-4"	22" (5)	4	4"	4	1/2"	XERXES

(1) TANKS SHALL BE XERXES, RIBBED, DOUBLE- WALL FIBERGLASS REINFORCED PLASTIC (FRP), UL LABELED UNDERGROUND STORAGE TANKS.

(2) SHALL MEET NFPA 30 AND 31.

(3) DRY INTERSTITIAL SPACE.

(4) TANKS SHALL BE TESTED AT THE FACTORY AND IN THE FIELD. SEE SHEET ME502. VACUUM TESTED AT 11.5" OF MERCURY; 5 PSIG AIR/SOAP, ULTRASONIC -THICKNESS VERIFICATION AND A BARCOL - HARDNESS TEST.

(5) TANK MANHOLE SHALL BE EQUIPPED WITH TWO 4" CONNECTIONS - CONFIGURATION B.

PUMP SCHEDULE

SYMBOL	TYPE	GPM	PSI	RPM	SUCTION SIZE	DISCHARGE SIZE	MOTOR			SIZE	SERVICE	COMMENTS	SCHEDULE NOTES
							V - Ø - Hz	HP	RPM				
FOP 1	POSITIVE DISPLACEMENT	13	100	1800	1"	1"	208/3ϕ/60	1.5		TUTHILL 5LE 88606	#2 FUEL OIL	BASE MOUNTED	1,2
FOP 2	POSITIVE DISPLACEMENT	13	100	1800	1"	1"	208/3ϕ/60	1.5		TUTHILL 5LE 88606	#2 FUEL OIL	BASE MOUNTED	1,2

1. SEE SPECIFICATIONS FOR OTHER APPROVED MANUFACTURERS.

2. TUTHILL ASSEMBLY STYLE A, WITH INLET ON LEFT SIDE AND OUTLET ON RIGHT SIDE WHEN FACING PUMP OR INLET ON THE RIGHT AND OUTLET ON THE LEFT WHEN FACING SHAFT END-V-C.

State of Utah
Department of Administrative Services
Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267
Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

PROJECT NAME & ADDRESS

SOUTHERN UTAH UNIVERSITY HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

Cedar City, Utah 84720

MARK	DATE	REVISION

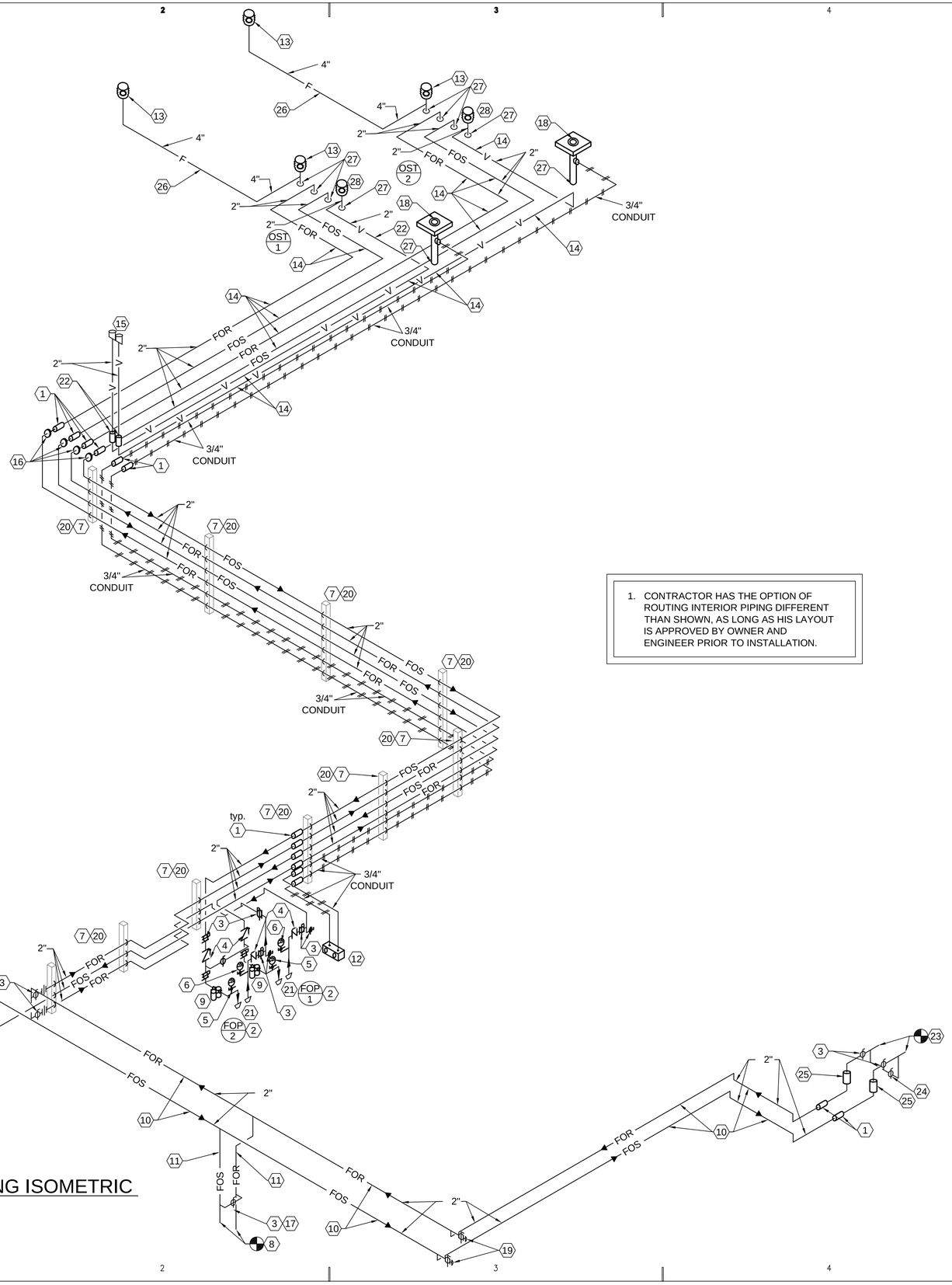
PROJECT MANAGER: WP
DRAWN BY: STAFF
CHECKED BY: SLW
DATE: 12/22/06
WHW JOB NO.: 06024

SHEET TITLE

TANK AND PUMP SCHEDULES

SHEET NO.

ME601



1. CONTRACTOR HAS THE OPTION OF ROUTING INTERIOR PIPING DIFFERENT THAN SHOWN, AS LONG AS HIS LAYOUT IS APPROVED BY OWNER AND ENGINEER PRIOR TO INSTALLATION.

OIL STORAGE TANK PIPING ISOMETRIC

SCALE: NONE

SHEET NOTES

1. SLEEVE THRU FOUNDATION WALL SEE DETAIL A1/ME502.
2. POSITIVE DISPLACEMENT PUMPS FOP-1 AND FOP-2. SEE DETAIL C4/ME503 AND PUMP SCHEDULE ME601.
3. BALL VALVE RATED FOR No. 2 OIL.
4. CHECK VALVE RATED FOR No. 2 OIL.
5. COMPOUND PRESSURE GAUGE.
6. PRESSURE GAUGE 0-180 PSIG.
7. ROUTE PIPING ONE UNDER THE OTHER. PROVIDE VERTICLE UNISTRUT ON WALL WITH PIPE CLAMP FOR SUPPORT. SEE DETAIL A4/ME503.
8. CONNECT TO EXISTING COEN OIL BURNER CONNECTIONS. EXISTING PIPING CONTAINED No. 5 FUEL OIL. THIS CONTRACTOR SHALL REMOVE EXISTING PIPING, CLEAN PIPING OF OLD OIL AND REPLACE. CONTACT ALLEN WOODBURY OF NORTH ASSOCIATES @ (801) 274-3333 FOR INFORMATION ON COEN BURNER, START UP USING No. 2 FUEL OIL AND REINSTALLATION OF EXISTING BURNER PIPING.
9. DUPLEX OIL STRAINER FLG'D CONNECTION. VALVE SO SYSTEM STILL FUNCTIONS DURING CHANGING OF FILTERS. SEE DETAIL C4/ME503.
10. SUPPORT EITHER FROM ABOVE OR BELOW EXISTING PIPING TRAPEZE HORIZONTAL HANGERS. ADD ADDITIONAL SUPPORT STEEL IF REQUIRED FOR SUPPORT REQUIRED SPACING.
11. USE SAME SUPPORTS FOR NEW VERITICAL DROPS AS EXISTING.
12. COMBINATION LEAK AND TANK LEVEL MONITOR. MOUNT ON WALL. COORDINATE WITH SUU FOR EXACT LOCATION OF PANEL. SEE DETAIL C2/ME503
13. 4" O.P.W. FILL FITTING AND SPILL CONTAINMENT. PROVIDE LOCKING COVER. SEE DETAIL B2/ME503.
14. 2" DOUBLE WALL FRP PIPE FROM TANK TO INSIDE BUILDING FLANGE.
15. 2" VENT. TERMINATE 12'-0" ABOVE GRADE WITH OPW 23-0033 OPEN ATMOSPHERE VENT WITH SCREEN. SEE DETAIL B1/ME502.
16. FRP FLANGE TO STEEL FLANGE. ROUTE INTERIOR FUEL OIL IN SCHEDULE 80 CARBON STEEL PIPING. SEE DETAIL A1/ME502.
17. 1-1/2" CIRCULATION BY-PASS PIPING WITH BALL VALVE AND UNION.
18. 8" MONITOR ACCESS MANWAY AND SPILL CONTAINMENT. COVER SHALL BE HEAVY DUTY LOCKING COVER. SEE DETAIL C1/ME501.
19. 2" END OF MAINS BALL VALVES AND CAPS.
20. FIELD VERIFY EXACT LOCATIONS OF UNISTRUT AND MEANS FOR CONNECTION TO WALL OR STRUCTURE.
21. 2"x1" CONCENTRIC REDUCER AT PUMP INLETS AND OUTLETS.
22. SLEEVE THRU ASPHALT, SEAL AIR AND WATER TIGHT. PROVIDE FRP TO STEEL CONNECTION.
23. CONNECT TO EMERGENCY GENERATOR DAY TANK, COORDINATE WITH ELECTRICAL AND EMERGENCY GENERATOR MANUFACTURER FOR EXACT LOCATION OF CONNECTIONS TO TANK.
24. 3/4" CIRCULATION BY-PASS PIPING WITH BALL VALVE AND UNION.
25. SLEEVE THROUGH CONCRETE PAD. SEAL OPENINGS AIR AND WATER TIGHT.
26. 4" DOUBLE WALL FRP FILL PIPE.
27. UST PIPE CONNECTIONS.
28. VENT EXTRACTION AND SPILL CONTAINMENT ABOVE TANK.

State of Utah
Department of Administrative Services

Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267

Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

PROJECT NAME & ADDRESS

SOUTHERN UTAH UNIVERSITY HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

Cedar City, Utah 84720

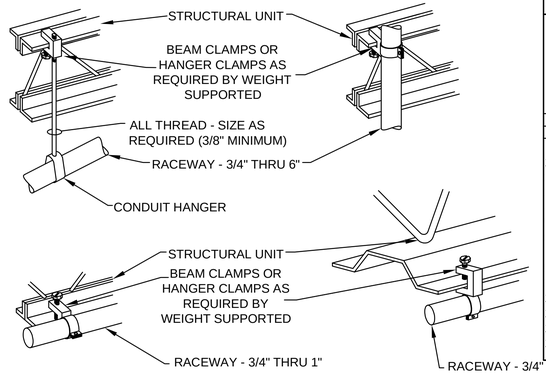
MARK	DATE	REVISION

PROJECT MANAGER: WP
DRAWN BY: STAFF
CHECKED BY: SLW
DATE: 12/22/06
WHW JOB NO.: 06024

SHEET TITLE
OIL STORAGE TANK PIPING ISOMETRIC

SHEET NO.
ME901

NOTE:
WIRE SHALL NOT BE USED AS A COMPONENT OF ANY RACEWAY HANGER SYSTEM.
DO NOT SUPPORT ANY RACEWAY LARGER THAN 1" FROM BOTTOM CORD OF STEEL TRUSSES.



C1 TYPICAL RACEWAT SUPPORT METHODS DETAIL
SCALE: NONE

EQUIPMENT SCHEDULE

UNIT #	FUNCTION	LOAD	VOLT	PHASE	FULL LOAD AMPS	CONDUIT SIZE	NO. SETS	WIRES NO.	WIRES SIZE	OCPD TYPE	OCPD AMPS	REF. NOTES STARTER	REF. NOTES DISCONNECT	REF. NOTES OTHER	REMARKS
FOP-1	PUMP	1.5 HP	208	3	6.60	3/4"	1	3	12	CB	20		7A		
FOP-2	PUMP	1.5 HP	208	3	6.60	3/4"	1	3	12	CB	20		7A		

NOTES:
1. NON-FUSED DISCONNECT SWITCH
2. FUSED DISCONNECT SWITCH
3. BREAKER IN ENCLOSURE
4. MANUAL STARTER W/THERMAL OVERLOAD
5. MAGNETIC STARTER
6. MAGNETIC STARTER/NON-FUSED DISCONNECT COMBINATION
7. MAGNETIC STARTER/FUSED DISCONNECT COMBINATION
8. MAGNETIC STARTER/BREAKER COMBINATION
9. VARIABLE FREQUENCY DRIVE
10. REDUCED VOLTAGE STARTER
11. DIRECT CONNECTION
12. RECEPTACLE/SPECIAL PURPOSE OUTLET/ETC.
13. TWO-SPEED STARTER, COORDINATE W/MOTOR TYPE

A. FURNISHED, INSTALLED, AND CONNECTED UNDER DIVISION 16
B. FURNISHED AND INSTALLED UNDER ANOTHER DIVISION REQUIRING CONNECTION UNDER DIVISION 16.
C. FURNISHED UNDER ANOTHER DIVISION BUT INSTALLED AND CONNECTED UNDER DIVISION 16.
D. FURNISHED, INSTALLED AND CONNECTED UNDER ANOTHER DIVISION.

OVER CURRENT PROTECTIVE DEVICES:

CB = CIRCUIT BREAKER - THERMAL MAGNETIC
FN = FUSE - NON INDUCTIVE LOAD
FI = FUSE - INDUCTIVE LOAD
MO = MAGNETIC ONLY CIRCUIT BREAKER

GENERAL NOTES

1. VERIFY ALL EQUIPMENT DIMENSIONS AND LOCATIONS BEFORE BEGINNING ROUGH IN. CONSULT ALL APPLICABLE CONTRACT DRAWINGS AND SHOP DRAWINGS TO INSURE NEC CODE CLEARANCES REQUIRED AROUND ALL ELECTRICAL EQUIPMENT.
2. CONTRACTOR SHALL VERIFY ALL ELECTRICAL LOADS (VOLTAGE, PHASE, CONNECTION REQUIREMENTS, ETC.) OF EQUIPMENT FURNISHED UNDER DIVISION 15 WITH APPROVED MECHANICAL SHOP DRAWINGS BEFORE BEGINNING ROUGH IN.
3. SEE APPLICABLE SHOP DRAWINGS FOR ROUGH IN LOCATION OF ALL EQUIPMENT, WIRING DEVICES, ETC.
4. THE ELECTRICAL CONTRACTOR SHALL NOTIFY AND COOPERATE WITH THE MECHANICAL CONTRACTOR SUCH THAT NO PIPING, DUCTS, OR EQUIPMENT FOREIGN TO THE OPERATION OF THE ELECTRICAL EQUIPMENT SHALL BE PERMITTED TO BE INSTALLED IN, ENTER OR PASS THRU ELECTRICAL ROOMS OR SPACES, OR ABOVE OR BELOW ELECTRICAL EQUIPMENT IN OTHER AREAS.
5. ELECTRICAL BOXES SHALL NOT BE LOCATED IN MASONRY COLUMNS IN BRICK WALLS OR IN GROUTED CELLS ADJACENT TO OPENINGS. COORDINATE LOCATION OF BOXES WITH EXISTING CONDITIONS.
6. ALL PENETRATIONS OF FIRE RATED FLOORS, WALLS, AND CEILINGS SHALL BE SEALED WITH APPROVED MATERIAL TO MAINTAIN FIRE RATING OF SURFACE PENETRATED.
7. CIRCUITS EXTENDING OVER 70' FOR 120 VOLT AND 165' FOR 277 VOLT 20 AMP CIRCUITS SHALL BE RUN WITH MINIMUM #10 CONDUCTORS.

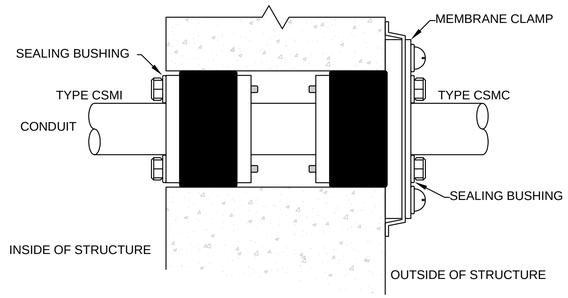
ELECTRICAL SYMBOL SCHEDULE

1. SEE FIXTURE SCHEDULE FOR TYPE, MOUNTING AND WATTAGE.-
2. HEIGHT MEASURED TO TOP LINE OF THE BOX FROM THE FINISH FLOOR.-
3. REFER TO DRAWINGS FOR DIRECTIONAL ARROWS.-
4. SUBSCRIPT KEYS SWITCH TO FIXTURES CONTROLLED.-
5. NEMA TYPE 'ND' NON-FUSED UNLESS NOTED 'F' (FUSED). USE 'HD' 480 V.-
6. HEIGHT TO BE THE LOWER OF EITHER 80" A.F.F. OR 6" BELOW CEILING.-
7. PROVIDE H.O.A. AND S.S. PUSHBUTTONS AS REQUIRED.-
8. DOUBLE ARROWS DENOTE A DOUBLE FACE UNIT.-
9. COORDINATE WITH MILLWORK SHOP DRAWINGS AND ELEVATIONS FOR HEIGHT.-
10. SUBSCRIPT DENOTES NEMA CONFIGURATION.-
11. HEIGHT MEASURED TO BOTTOM OF THE BOX FROM FINISH FLOOR.-

STANDARD MOUNTING HEIGHT UNLESS OTHERWISE NOTED ON PLANS-

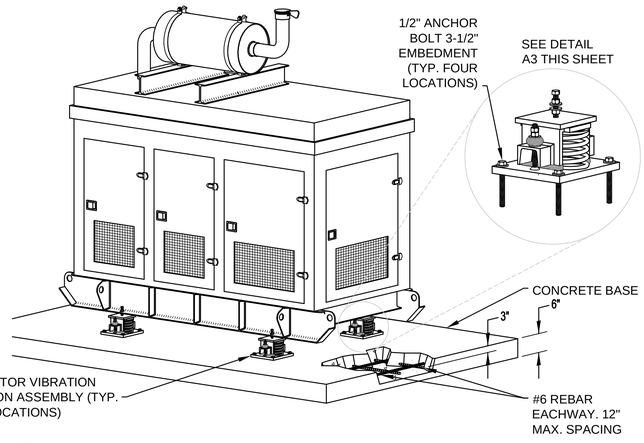
SYMBOL	DESCRIPTION	MOUNTING HEIGHT	NOTES
	ONE CIRCUIT, TWO WIRE HOME RUN TO PANEL		
	2 CIRCUIT, 3 WIRE, COMMON NEUTRAL HOME RUN		
	3 CIRCUIT, 4 WIRE, COMMON NEUTRAL HOME RUN		
	CONDUIT RUN CONCEALED IN WALL OR CEILING		
	CONDUIT RUN CONCEALED IN FLOOR OR GROUND		
	CONDUIT UP		
	CONDUIT DOWN		
	CONDUIT STUB LOCATION	CAP CONDUIT	
	CABLE TRAY	AS NOTED	
	DUPLEX RECEPTACLE	+16" OR AS NOTED	9. 11.
A	DUPLEX RECEPTACLE		9.
W	ELECTRIC WATER COOLER RECEPTACLE		SEE DIAGRAM
WP	WEATHERPROOF RECEPTACLE	+24" OR AS NOTED	2. 9.
	GROUND FAULT INTERRUPTER DUPLEX RECEPTACLE	+16" OR AS NOTED	9. 11.
	DUPLEX RECEPTACLE EMERGENCY POWER (RED)	+16" OR AS NOTED	9. 11.
	FOURPLEX RECEPTACLE	+16" OR AS NOTED	9. 11.
	DATA OUTLET	+16" OR AS NOTED	9. 11.
	TELEPHONE OUTLET	+16" OR AS NOTED	9. 11.
	TELEPHONE/DATA OUTLET	+16" OR AS NOTED	9. 11.
J	JUNCTION BOX ('F' IN FLOOR)	AS NOTED	
	MOTOR OUTLET	TO SUIT EQUIP.	
	PUSHBUTTON	+4'-0"	2.
J	NON-FUSED DISCONNECT SWITCH	+5'-0"	5.
FJ	FUSED DISCONNECT SWITCH	+5'-0"	5.
^{T}	MANUAL STARTER THERMAL OVERLOAD SWITCH WITH PILOT LIGHT	+4'-0"	2.
	MAGNETIC STARTER	+5'-0"	7.
J	MAGNETIC STARTER / DISCONNECT COMBINATION	+5'-0"	
VFD	VARIABLE FREQUENCY DRIVE	+6'-6"	
	PANEL BOARD	TOP AT +6'-0"	
	MAIN DISTRIBUTION PANEL		
	TELEPHONE TERMINAL BOARD		
842	ARCHITECTURAL ROOM NUMBER		
A	LIGHT FIXTURE (LETTER DESIGNATES TYPE)		
EQ 34	EQUIPMENT NUMBER		

TYPE CSMI AND CSMC
CORED HOLE APPLICATION



B1 CONDUIT PENETRATION THRU WALL ABOVE AND BELOW GRADE DETAIL
SCALE: NONE

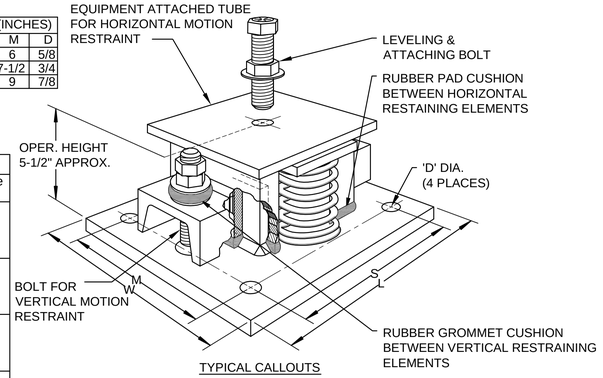
INDEX OF ELECTRICAL DRAWINGS



A1 GENERATOR WITH VIBRATION ISOLATOR DETAIL
SCALE: NONE

BASE PLATE DESIGNATION	DIMENSIONS (INCHES) L	S	W	M	D
7855	10	8-1/2	7-1/2	6	5/8
7856	10	8-1/2	9	7-1/2	3/4
7857	12	10	10-1/2	9	7/8

VIBRATION ISOLATION CHAR. Type	Max. Load (lbs)	Max. Defl. (in)	Spring Rate (lbs/in)
RJSD	42K	1.13	36
RJSD	110K	1.13	98
RJSD	158K	1.13	140
RJSD	212K	1.13	188
RJSD	240K	2.30	104
RJSD	304K	2.00	152
RJSD	402K	1.70	236
RJSD	488K	1.13	432
RJSD	592K	1.80	370
RJSD	636K	1.13	562
RJSD	790K	1.80	440
RJSD	1022K	1.50	682
RJSD	1430K	1.13	1100
RJSD	2120K	1.00	2120
RJSD	3040K	.78	3900
RJSD	3920K	.78	5030



TYPICAL CALLOUTS

RJSD 1022K 7855 (MIN. BASE SIZE FOR USE WITH 1/2" ANCHORS)

RJSD 3040K 7857 (MIN. BASE SIZE FOR USE WITH 3/4" ANCHORS)

SPRING ISOLATOR SHALL PROVIDE VIBRATION AND EARTHQUAKE PROTECTION FOR SIZE AND WEIGHT OF NEW GENERATOR PROVIDED.

A3 GENERATOR WITH VIBRATION ISOLATOR ASSEMBLY
SCALE: NONE

DEMOLITION NOTES

1. COORDINATE ALL NEW ELECTRICAL EQUIPMENT REQUIREMENTS AND MAKE CONNECTION TO EXISTING SYSTEMS. THIS INCLUDES LIGHTING, POWER, SIGNAL, RACEWAY AND OTHER SYSTEMS INCLUDED UNDER DIVISION 16.
2. RELOCATE, REWIRE AND/OR RECONNECT EXISTING ELECTRICAL DEVICES AND/OR EQUIPMENT THAT FOR ANY REASON OBSTRUCTS CONSTRUCTION.
3. CONCEAL ALL RACEWAY AND WIRING IN EXISTING WALLS, CEILINGS, FLOORS, ETC. EXCEPT WHERE THE USE OF SURFACE METAL RACEWAYS (E.G. WIRE MOLD) IS INDICATED ON DRAWINGS OR IN SPEC.
4. EXISTING RACEWAYS MAY BE REUSED (IN PLACE) WHERE POSSIBLE, AND WHERE IN COMPLIANCE WITH THE SPECIFICATIONS AND THE INTENT OF THE CONTRACT DOCUMENTS. INSURE INTEGRITY OF EXISTING RACEWAY BEFORE REUSE.
5. REMOVE ALL RACEWAYS, CONDUCTORS, BOXES, DEVICES, EQUIPMENT, ETC. THAT ARE NOT TO BE REUSED.
6. DO NOT PENETRATE STRUCTURAL ELEMENTS OF FLOORS, WALLS, CEILINGS, ROOFS, ETC.
7. DISCONNECT AND RECONNECT ANY/ALL FIXTURES, DEVICES, EQUIPMENT, ETC. REQUIRED FOR PROPER COMPLETION OF THE WORK.

State of Utah
Department of Administrative Services
Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267
Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

BNA CONSULTING
1070 W 1600 S, Suite A104
St. George, Utah 84770
P:435.628.3670
F:435.628.3680
www.bnaconsulting.com
SALT LAKE ST.GEORGE LAS VEGAS PHOENIX

PROJECT NAME & ADDRESS

HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

Cedar City, Utah 84720

MARK	DATE	REVISION

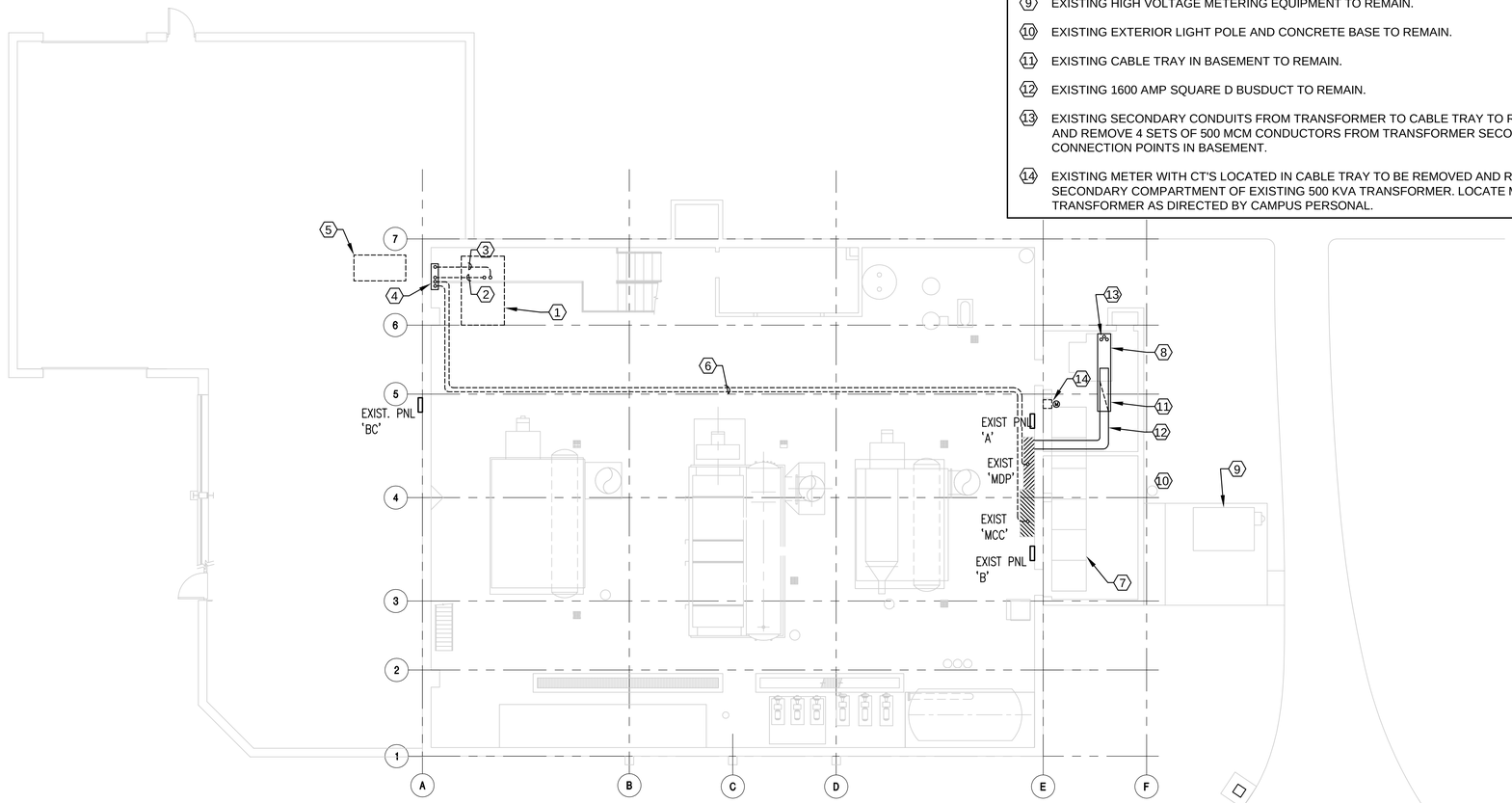
PROJECT MANAGER: LR
DRAWN BY: SR
CHECKED BY: GM
DATE: 12/22/06
WHW JOB NO.: 06024

SHEET TITLE
SYMBOLS, NOTES AND SCHEDULES

SHEET NO.
EG101

SHEET KEYNOTES

1. EXISTING 150 KW EMERGENCY GENERATOR TO BE DISCONNECTED AND REMOVED. DISCONNECT AND REMOVE ALL ASSOCIATED CONDUIT AND WIRE. REMOVE GENERATOR FROM INSIDE OF BUILDING AND PLACE OUTSIDE AS DIRECTED BY CAMPUS PERSONAL.
2. EXISTING 4" CONDUIT WITH 4 #500 MCM CU. CONDUCTORS TO BE REMOVED.
3. EXISTING EMPTY 1 1/2:" CONDUIT TO BE REMOVED.
4. EXISTING ZENITH 400 AMP AUTOMATIC TRANSFER SWITCH TO BE DISCONNECTED, REMOVED AND DISPOSED OF AS DIRECTED BY CAMPUS PERSONAL.
5. EXISTING DIESEL GENERATOR FUEL TANK TO BE REMOVED. DISCONNECT AND REMOVE ALL ASSOCIATED PIPING.
6. TWO SETS OF 4" CONDUIT WITH 4 #500 MCM CONDUCTORS EA. TO BE DISCONNECTED AND REMOVED FROM TRANSFER SWITCH TO MAIN PANEL OR MCC AS INDICATED.-
7. EXISTING EXTERIOR HIGH VOLTAGE SWITCHGEAR TO REMAIN.
8. EXISTING 500 KVA PAD MOUNTED TRANSFORMER 12470-120/208V TO REMAIN.
9. EXISTING HIGH VOLTAGE METERING EQUIPMENT TO REMAIN.
10. EXISTING EXTERIOR LIGHT POLE AND CONCRETE BASE TO REMAIN.
11. EXISTING CABLE TRAY IN BASEMENT TO REMAIN.
12. EXISTING 1600 AMP SQUARE D BUSDUCT TO REMAIN.
13. EXISTING SECONDARY CONDUITS FROM TRANSFORMER TO CABLE TRAY TO REMAIN. DISCONNECT AND REMOVE 4 SETS OF 500 MCM CONDUCTORS FROM TRANSFORMER SECONDARY TO BUSDUCT CONNECTION POINTS IN BASEMENT.
14. EXISTING METER WITH CT'S LOCATED IN CABLE TRAY TO BE REMOVED AND RELOCATED TO SECONDARY COMPARTMENT OF EXISTING 500 KVA TRANSFORMER. LOCATE METER ON EXTERIOR OF TRANSFORMER AS DIRECTED BY CAMPUS PERSONAL.



ELECTRICAL DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

State of Utah
Department of Administrative Services

Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267

Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

BNA CONSULTING
1070 W 1600 S, Suite A104
St. George, Utah 84770
P:435.628.3670
F:435.628.3680
www.bnaconsulting.com
SALT LAKE ST.GEORGE LAS VEGAS PHOENIX

PROJECT NAME & ADDRESS

HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

Cedar City, Utah 84720

MARK	DATE	REVISION

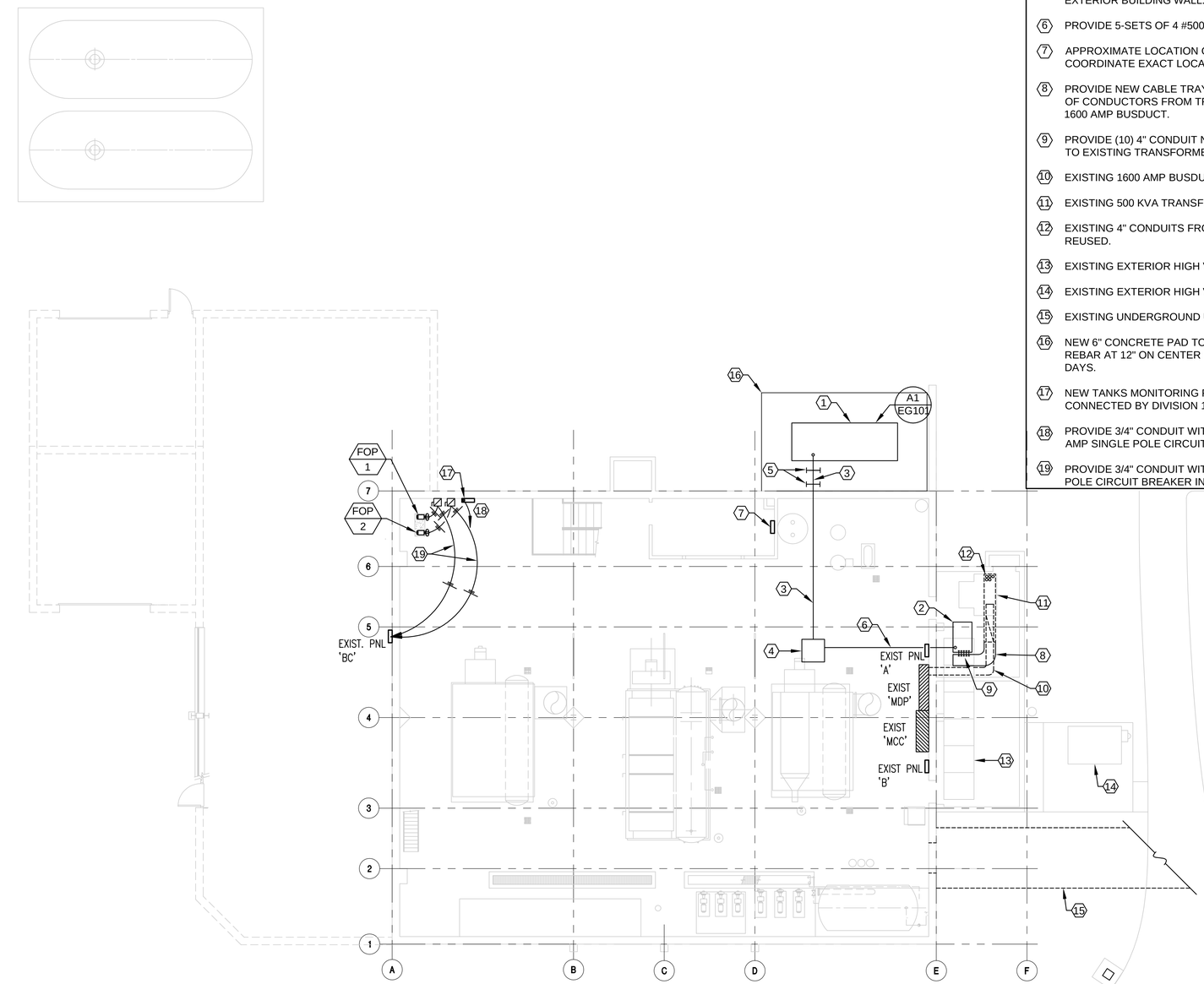
PROJECT MANAGER:	LR
DRAWN BY:	SR
CHECKED BY:	GM
DATE:	12/22/06
WHW JOB NO.:	06024

SHEET TITLE

ELECTRICAL DEMOLITION PLAN

SHEET NO.

ED101



ELECTRICAL PLAN

SCALE: 1/8" = 1'-0"

SHEET KEYNOTES

1. NEW 500 KW EMERGENCY GENERATOR WITH WEATHERPROOF ENCLOSURE. SEE ONE LINE DIAGRAM SHEET EX101 AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. NEW 1600 AMP 3 POLE AUTOMATIC TRANSFER SWITCH 'ATS-1' IN BASEMENT. SEE ONE LINE DIAGRAM SHEET EX101 AND SPECIFICATIONS FOR ADDITIONAL REQURIEMENTS.
3. 5-SETS OF 4 #500 MCM XHHW CU. IN 4" CONDUIT FROM GENERATOR TO ATS-1. PROVIDE LIQUID TIGHT CONDUIT FROM GENERATOR TO SECOND UNISTRUT SUPPORT FOR VIBRATION ISOLATION. PROVIDE GRC OR IMC CONDUIT FOR REMAINING LENGTH.
4. PROVIDE 36"X36"X12" JUNCTION BOX WITH REMOVABLE COVER.
5. PROVIDE A MINIMUM OF TWO UNISTRUT FRAME FOR SUPPORTS FOR CONDUITS FROM GENERATOR TO EXTERIOR BUILDING WALL.
6. PROVIDE 5-SETS OF 4 #500 MCM XHHW CU. IN 4" CONDUIT FROM JUNCTION BOX TO ATS-1.
7. APPROXIMATE LOCATION OF REMOTE ANNUNCIATOR PANEL PROVIDED AND INSTALLED BY DIVISION 16. COORDINATE EXACT LOCATION WITH CAMPUS PERSONNEL PRIOR TO ROUGH-IN.
8. PROVIDE NEW CABLE TRAY RADIUS AND EXTENSION FROM ATS-1 TO EXISTING CABLE TRAY FOR INSTALLATION OF CONDUCTORS FROM TRANSFORMER TO ATS-1 AND FROM ATS-1 TO CONNECTION POINTS ON EXISTING 1600 AMP BUSDUCT.
9. PROVIDE (10) 4" CONDUIT NIPPLES FROM ATS-1 TO NEW CABLE TRAY. EXTEND NEW CONDUCTORS FROM ATS-1 TO EXISTING TRANSFORMER AND BUSDUCT TERMINATION POINTS.
10. EXISTING 1600 AMP BUSDUCT TO REMAIN AND BE REUSED.
11. EXISTING 500 KVA TRANSFORMER 12470-120/208 VOLT THREE PHASE TO REMAIN.
12. EXISTING 4" CONDUITS FROM TRANSFORMER SECONDARY TO CABLE TRAY LOCATION TO REMAIN AND BE REUSED.
13. EXISTING EXTERIOR HIGH VOLTAGE SWITCHGEAR TO REMAIN.
14. EXISTING EXTERIOR HIGH VOLTAGE METERING EQUIPMENT TO REMAIN.
15. EXISTING UNDERGROUND UTILITY TUNNEL TO REMAIN AND BE PROTECTED DURING CONSTRUCTION.
16. NEW 6" CONCRETE PAD TO BE INSTALLED WITH TOP OF PAD 4" ABOVE ADJACENT SURFACE. PROVIDE #6 REBAR AT 12" ON CENTER EACH WAY THROUGH OUT NEW CONCRETE. PROVIDE 3000 PSI CONCRETE AT 28 DAYS.
17. NEW TANKS MONITORING PANEL PROVIDED BY DIVISION 15. 120 VOLT POWER PROVIDED, INSTALLED AND CONNECTED BY DIVISION 16. ALL OTHER CONTROL/MONITORING WIRING PROVIDED UNDER DIVISION 15.
18. PROVIDE 3/4" CONDUIT WITH 2 #12 THHN CU. AND 1 #12 GROUND FROM TANK MONITORING PANEL TO SPARE 20 AMP SINGLE POLE CIRCUIT BREAKER LOCATED IN EXISTING PANEL 'BC.
19. PROVIDE 3/4" CONDUIT WITH 3 #12 THHN CU. AND 1 #12 GROUND FROM TRANSFER PUMP TO NEW 20 AMP 3 POLE CIRCUIT BREAKER INSTALLED IN EXISTING SQUARE-D NQOD PANEL 'BC'

State of Utah
Department of Administrative Services

Division of Facilities
Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267

Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

BNA CONSULTING
1070 W 1600 S, Suite A104
St. George, Utah 84770
P:435.628.3670
F:435.628.3680
www.bnaconsulting.com
SALT LAKE ST.GEORGE LAS VEGAS PHOENIX

PROJECT NAME & ADDRESS

HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

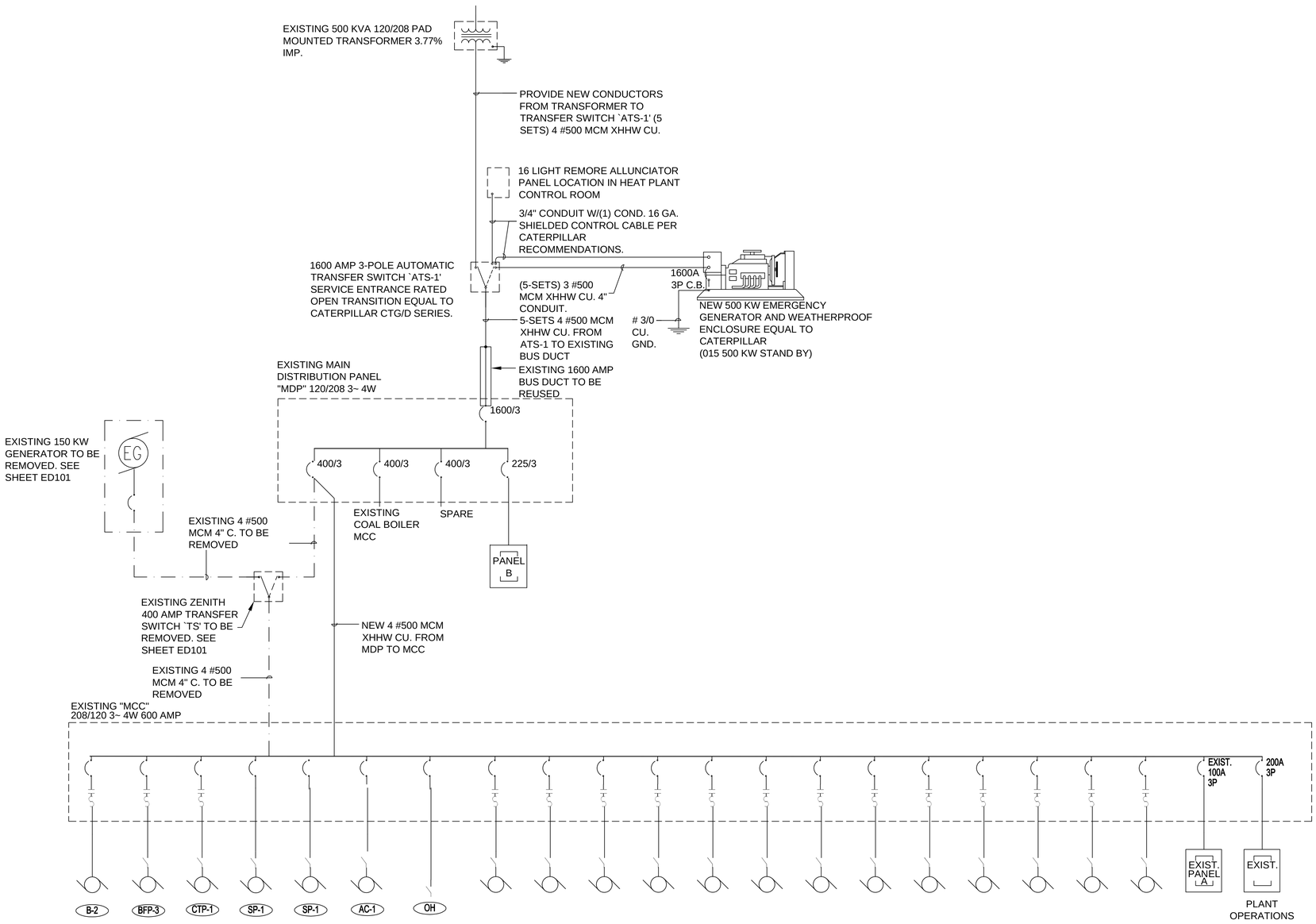
Cedar City, Utah 84720

MARK	DATE	REVISION

PROJECT MANAGER: LR
DRAWN BY: SR
CHECKED BY: GM
DATE: 12/22/06
WHW JOB NO.: 06024

SHEET TITLE
ELECTRICAL PLAN

SHEET NO.
EE101



ONE-LINE DIAGRAM

SCALE: NONE

State of Utah
Department of Administrative Services

Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267

Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

BNA CONSULTING
1070 W 1600 S, Suite A104
St. George, Utah 84770
P:435.628.3670
F:435.628.3680
www.bnaconsulting.com
SALT LAKE ST.GEORGE LAS VEGAS PHOENIX

PROJECT NAME & ADDRESS

HEAT PLANT FUEL TANK & GENERATOR REPLACEMENT

DFCM No. 06127730

Cedar City, Utah 84720

MARK	DATE	REVISION

PROJECT MANAGER: LR
DRAWN BY: SR
CHECKED BY: GM
DATE: 12/22/06
WHW JOB NO.: 06024

SHEET TITLE
ONE-LINE DIAGRAM

SHEET NO.
EX101